Vol. 1119 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

1790 ***Celebrating 200 Years of Creativity*** 1990

PATENTS

October 9, 1990

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

October 9, 1990 Volume 1119 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed.

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $10.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1118 O.G. 14 on Sept. 11, 1990.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of March 1, 1990, and was announced in the *Official Gazette* at 1111 O.G. 24 on Feb. 20, 1990.

International PCT fees were changed on September 1, 1990 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1116 O.G. 32 on July 17, 1990.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1242.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	502.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	122.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	154.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Aug. 16, 1990

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on October 6, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,697,285 through 4,698,843
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on October 4, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,407,021 through 4,408,354
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JULY 29, 1990
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,340,979	06/244,930	7/27/82
4,340,985	06/217,141	7/27/82
4,340,986	06/316,229	7/27/82
4,340,995	06/250,306	7/27/82
4,341,015	06/303,205	7/27/82
4,341,058	06/231,808	7/27/82
4,341,065	06/271,261	7/27/82
4,341,066	06/271,262	7/27/82
4,341,080	06/265,937	7/27/82
4,341,144	06/229,307	7/27/82
4,341,146	06/231,682	7/27/82
4,341,157	06/248,311	7/27/82
4,341,168	06/262,348	7/27/82
4,341,181	06/232,010	7/27/82
4,341,223	06/231,039	7/27/82
4,341,249	06/290,534	7/27/82
4,341,252	06/288,891	7/27/82
4,341,255	06/273,225	7/27/82
4,341,319	06/240,612	7/27/82
4,341,339	06/247,393	7/27/82
4,341,341	06/273,960	7/27/82
4,341,371	06/216,772	7/27/82
4,341,392	06/221,360	7/27/82
4,341,452	06/291,272	7/27/82
4,341,453	06/261,040	7/27/82
4,341,516	06/264,348	7/27/82
4,341,519	06/238,664	7/27/82
4,341,535	06/222,190	7/27/82
4,341,536	06/224,435	7/27/82
4,341,545	06/258,739	7/27/82
4,341,554	06/250,328	7/27/82
4,341,566	06/230,520	7/27/82
4,341,609	06/238,307	7/27/82
4,341,627	06/261,144	7/27/82
4,341,630	06/273,445	7/27/82
4,341,639	06/230,714	7/27/82
4,341,644	06/306,457	7/27/82
4,341,646	06/280,272	7/27/82
4,341,647	06/231,646	7/27/82
4,341,682	06/219,470	7/27/82
4,341,686	06/287,878	7/27/82
4,341,727	06/225,070	7/27/82
4,341,773	06/241,666	7/27/82
4,341,778	06/280,349	7/27/82
4,341,780	06/267,450	7/27/82
4,341,787	06/239,238	7/27/82
4,341,798	06/283,430	7/27/82
4,341,808	06/223,838	7/27/82
4,341,817	06/263,657	7/27/82
4,341,831	06/260,407	7/27/82
4,341,835	06/228,195	7/27/82
4,341,839	06/217,523	7/27/82
4,341,848	06/240,659	7/27/82
4,341,858	06/259,790	7/27/82
4,341,864	06/243,039	7/27/82
4,341,895	06/240,179	7/27/82
4,341,897	06/249,117	7/27/82
4,341,903	06/253,099	7/27/82
4,341,909	06/301,609	7/27/82
4,341,990	06/258,227	7/27/82
4,342,065	06/252,985	7/27/82
4,602,386	06/723,323	7/29/86
4,602,388	06/619,091	7/29/86
4,602,393	06/690,847	7/29/86
4,602,394	06/687,840	7/29/86
4,602,395	06/605,880	7/29/86
4,602,398	06/748,179	7/29/86
4,602,401	06/673,801	7/29/86
4,602,415	06/644,062	7/29/86
4,602,416	06/582,340	7/29/86
4,602,427	06/756,711	7/29/86
4,602,431	06/697,019	7/29/86
4,602,435	06/740,032	7/29/86
4,602,437	06/700,242	7/29/86
4,602,441	06/725,987	7/29/86
4,602,451	06/715,916	7/29/86
4,602,453	06/688,822	7/29/86
4,602,464	06/592,909	7/29/86
4,602,465	06/628,919	7/29/86
4,602,475	06/540,747	7/29/86
4,602,478	06/624,770	7/29/86
4,602,481	06/535,980	7/29/86
4,602,488	06/660,912	7/29/86
4,602,496	06/660,226	7/29/86
4,602,498	06/720,783	7/29/86
4,602,499	06/688,990	7/29/86

Patent Number	Serial Number	Issue Date
4,602,507	06/725,083	7/29/86
4,602,512	06/722,447	7/29/86
4,602,513	06/724,650	7/29/86
4,602,516	06/725,490	7/29/86
4,602,517	06/700,285	7/29/86
4,602,518	06/545,248	7/29/86
4,602,519	06/663,282	7/29/86
4,602,523	06/653,607	7/29/86
4,602,527	06/622,532	7/29/86
4,602,545	06/694,373	7/29/86
4,602,550	06/517,525	7/29/86
4,602,551	06/608,073	7/29/86
4,602,552	06/623,873	7/29/86
4,602,555	06/575,813	7/29/86
4,602,560	06/576,505	7/29/86
4,602,563	06/706,145	7/29/86
4,602,575	06/629,629	7/29/86
4,602,576	06/796,192	7/29/86
4,602,586	06/685,884	7/29/86
4,602,591	06/730,483	7/29/86
4,602,597	06/586,265	7/29/86
4,602,598	06/755,226	7/29/86
4,602,614	06/556,571	7/29/86
4,602,615	06/772,531	7/29/86
4,602,616	06/762,896	7/29/86
4,602,617	06/767,396	7/29/86
4,602,628	06/692,663	7/29/86
4,602,646	06/735,690	7/29/86
4,602,647	06/688,395	7/29/86
4,602,658	06/752,888	7/29/86
4,602,659	06/600,893	7/29/86
4,602,660	06/753,388	7/29/86
4,602,661	06/559,962	7/29/86
4,602,665	06/728,679	7/29/86
4,602,670	06/679,134	7/29/86
4,602,689	06/230,590	7/29/86
4,602,694	06/635,406	7/29/86
4,602,703	06/638,018	7/29/86
4,602,705	06/438,598	7/29/86
4,602,710	06/755,789	7/29/86
4,602,711	06/620,905	7/29/86
4,602,716	06/552,176	7/29/86
4,602,720	06/798,693	7/29/86
4,602,723	06/791,736	7/29/86
4,602,724	06/557,151	7/29/86
4,602,725	06/485,702	7/29/86
4,602,728	06/712,259	7/29/86
4,602,732	06/657,348	7/29/86
4,602,735	06/675,377	7/29/86
4,602,742	06/658,582	7/29/86
4,602,746	06/672,787	7/29/86
4,602,748	06/653,292	7/29/86
4,602,749	06/692,989	7/29/86
4,602,755	06/765,666	7/29/86
4,602,756	06/674,982	7/29/86
4,602,757	06/554,689	7/29/86
4,602,765	06/603,167	7/29/86
4,602,772	06/712,125	7/29/86
4,602,773	06/672,680	7/29/86
4,602,777	06/639,206	7/29/86
4,602,781	06/479,607	7/29/86
4,602,782	06/677,742	7/29/86
4,602,786	06/753,863	7/29/86
4,602,800	06/690,494	7/29/86
4,602,818	06/570,503	7/29/86
4,602,819	06/496,348	7/29/86
4,602,821	06/655,536	7/29/89
4,605,822	06/648,907	7/29/86
4,602,827	06/575,671	7/29/86
4,602,839	06/695,477	7/29/86
4,602,841	06/537,066	7/29/86
4,602,852	06/599,900	7/29/86
4,602,858	06/667,354	7/29/86
4,602,869	06/557,847	7/29/86
4,602,874	06/794,902	7/29/86
4,602,875	06/799,142	7/29/86
4,602,878	06/515,926	7/29/86
4,602,887	06/742,749	7/29/86
4,602,902	06/390,949	7/29/86
4,602,914	06/550,744	7/29/86
4,602,916	06/769,612	7/29/86
4,602,924	06/665,628	7/29/86
4,602,931	06/708,324	7/29/86
4,602,941	06/646,553	7/29/86
4,602,944	06/654,909	7/29/86
4,602,945	06/592,353	7/29/86
4,602,965	06/589,267	7/29/86
4,602,968	06/774,523	7/29/86
4,602,980	06/656,390	7/29/86
4,602,983	06/572,497	7/29/86
4,602,986	06/654,637	7/29/86
4,602,989	06/776,737	7/29/86
4,603,002	06/675,605	7/29/86
4,603,021	06/732,454	7/29/86
4,603,024	06/706,484	7/29/86
4,603,030	06/652,865	7/29/86
4,603,031	06/737,863	7/29/86
4,603,032	06/654,159	7/29/86
4,603,058	06/658,315	7/29/86
4,603,068	06/656,984	7/29/86
4,603,078	06/601,531	7/29/86
4,603,105	06/382,843	7/29/86
4,603,109	06/616,442	7/29/86
4,603,111	06/539,749	7/29/86
4,603,137	06/639,312	7/29/86
4,603,140	06/736,894	7/29/86
4,603,178	06/667,008	7/29/86
4,603,185	06/565,430	7/29/86
4,603,196	06/612,561	7/29/86
4,603,198	06/482,734	7/29/86
4,603,229	06/693,873	7/29/86
4,603,239	06/751,973	7/29/86
4,603,252	06/549,393	7/29/86
4,603,261	06/601,788	7/29/86
4,603,267	06/588,573	7/29/86
4,603,289	06/636,623	7/29/86
4,603,307	06/700,782	7/29/86
4,603,315	06/652,082	7/29/86
4,603,318	06/551,053	7/29/86
4,603,327	06/560,229	7/29/86
4,603,328	06/640,830	7/29/86
4,603,329	06/541,241	7/29/86
4,603,335	06/717,291	7/29/86
4,603,343	06/523,589	7/29/86
4,603,366	06/630,465	7/29/86
4,603,378	06/732,006	7/29/86
4,603,404	06/453,575	7/29/86
4,603,409	06/614,473	7/29/86
4,603,411	06/610,759	7/29/86
4,603,433	06/671,567	7/29/86

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1), and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,370,355	06/291,866	1/25/83	8/10/81	11/10/87

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,503,894	06/526,007	3/12/85	8/24/83	8/23/90
4,538,497	06/446,184	9/03/85	12/02/82	9/05/90
4,558,933	06/499,313	12/17/85	5/31/83	8/31/90
4,559,539	06/514,763	12/17/85	7/18/83	8/30/90

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b).

4,620,196 Re. S.N. 07/564,696, Filed Aug. 7, 1990, Cl. 346, METHOD AND APPARATUS FOR HIGH RESOLUTION INK JET PRINTING, Carl H. Hertz, et al., Owner of Record:*Inventor*, Attorney or Agent: Toby H. Kusmer, Ex. Gp.: 216

4,917,669, Re. S.N. 07/572,900, Filed Aug. 24, 1990, Cl. 604/164, CATHETER INSERTER, Jean M. Bonaldo, Owner of Record: *Safety Ject, Rancho Cucamongo, Calif.*, Attorney or Agent: Robert R. Thornton, Ex. Gp.: 336

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,288,994, Reexam. No. 90/002,110, Requested Aug. 17, 1990, Cl. 623/006, POSTERIOR CHAMBER INTRA-OCULAR TRANSPLANT DEVICE, Henry M. Clayman, Owner of Record: *Inventor, Miami, Fla.*, Attorney or Agent: Cushman, Darby & Cushman, Washington, D.C., Ex. Gp.: 338, Requester: Alcon Surgical, Inc., Ft. Worth, Tex.

4,600,262, Reexam. No. 90/002,122, Requested Aug. 31, 1990, Cl. 389/147, ELECTRICAL CONNECTOR EMBODYING ELECTRICAL CIRCUIT COMPONENTS, Gerald R. Nieman, et al., Owner of Record: *ITT Corp., Santa Ana, Calif.*, Attorney or Agent: Thomas L. Peterson, Santa Ana, Calif., Ex. Gp.: 322, Requester: Owner

4,698,289, Reexam. No. 90/002,121, Requested Sept. 4, 1990, Cl. 430/106, PROCESS FOR MAKING FERRITE SPHERICAL PARTICULATE TONER CORE FROM RAW FLY ASH, Robert G. Adrich, et al., Owner of Record: *Halomet Inc., Syracuse, N.Y.*, Attorney or Agent: Bert J. Lewen, Wolfsey, Certilman, Haft, Lebow & Balin, New York, N.Y., Ex. Gp.: 156, Requester: Eugene L. Palazzo, Xerox Corp., Rochester, N.Y.

4,850,966, Reexam. No. 90/002,123, Requested Sept. 5, 1990, Cl. 604/082, DEVICE FOR THE ADMINISTRATION OF MEDICAMENT SUSPENSIONS, Ulrich Grau, et al., Owner of Record: *Hoechst Aktiengesesell, Frankfurt Au Main, Fed'l., Republic of Germany*, Attorney or Agent: Finnegan, Henderson, Farabow, Garrett & Dunner, Washington, D.C., Ex. Gp.: 336, Requester: Owner

Erratum

"All reference to Patent No. 4,957,789 to Charles E. Gibbons et al. of Alabama for 'NON-FOIL COMPOSITE STRUCTURES FOR PACKAGING JUICE' appearing in the Official Gazette of September 18, 1990 should be deleted since no patent was granted."

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Soon Guil Kim, Los Angeles, Calif., Reg. No. 1,462,865, for the mark "LA FLAMME", Canc. No. 18,727.

JEAN BROWN
Administrator, Trademark Trial and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

Patents Available for Licensing or Sale

3,961,865 CONVERSION BRACKET FOR WELL PUMP, Vernon E. Spaulding, R#3, P.O. Box 149, Vine Grove, KY 40175

4,266,548 APPARATUS FOR AND METHOD OF UTILIZING ENERGY TO EXERCISE PATHOLOGICAL TISSUE, Johnathan Bromberg, Esq.. Attorney for the estate of Samantha K. Davi, 50 W. Montgomery Ave., #260, Rockville, Md. 20850

4,465,232 PERFUME PACKET, Florence Rogge, 180 West End Ave., New York City, N.Y. 10013

4,469,098 APPARATUS FOR AND METHOD OF UTILIZING ENERGY TO EXCISE PATHOLOGICAL TISSUE, Johnathan Bromberg, Esq., Attorney for the estate of Samantha K. Davi, 50 W. Montgomery Ave., #260, Rockville, Md. 20850

4,901,665 LINE MARK BOOK MARK, Paul Carlin, 422 N. Austin Ave. Oak Park, Ill. 60302

4,924,665 LAWN MOWER BLADE ASSEMBLY, Gilbert A. Crosley, P.O. Box 878, Starke, Fla. 32091

4,925,063 DUAL PURPOSE CAP AND A DRIPLESS SPOUT IN A LIQUID CONTAINER, Athar Ali, 4698 Hwy 124, Hoschton, Ga. 30548

4,934,868 WATER CONTROL STRUCTURE AND ROLLER ASSEMBLY, Richard B. Hellstrom, 1515 Pine Hollow Drive, Fort Pierce, Fla. 34982

4,956,915 SANITARY NAIL CLIPPING DEVICE, Charles A. Anderson, 2402 108th N.E., Norman, Okla. 73071

D.308,218 MUSICAL COMPOSER, Joseph R. Sinkler Jr., c/o Walters, Morse & Harrington P.C., 940 Calder Plaza Bldg., Grand Rapids, Mich. 49503

PATENT NOTICES

Certificates of Correction For Week of October 9, 1990

D. 303,371	4,844,563	4,863,741	4,876,536
D. 307,817	4,844,601	4,863,997	4,876,712
4,444,564	4,844,954	4,863,999	4,877,028
4,743,077	4,845,398	4,864,562	4,877,188
4,766,115	4,846,795	4,865,027	4,878,067
4,778,134	4,847,073	4,865,172	4,878,437
4,791,133	4,847,677	4,865,717	4,879,095
4,794,933	4,848,635	4,866,302	4,879,131
4,795,269	4,848,810	4,866,535	4,879,421
4,798,157	4,849,008	4,866,553	4,880,587
4,802,146	4,850,336	4,867,333	4,880,674
4,802,147	4,850,704	4,867,559	4,880,929
4,802,985	4,852,520	4,867,747	4,880,977
4,803,021	4,853,628	4,867,872	4,881,782
4,807,829	4,853,768	4,868,204	4,882,792
4,812,767	4,853,896	4,868,572	4,883,006
4,813,699	4,854,019	4,869,315	4,883,256
4,814,830	4,854,147	4,869,319	4,883,464
4,817,312	4,854,579	4,869,491	4,884,045
4,818,690	4,855,461	4,869,795	4,885,095
4,820,450	4,856,101	4,870,080	4,885,380
4,821,109	4,856,334	4,870,226	4,885,465
4,821,259	4,857,076	4,871,188	4,885,485
4,822,537	4,857,334	4,871,538	4,885,567
4,825,899	4,857,625	4,871,598	4,886,162
4,826,331	4,857,698	4,871,890	4,886,629
4,827,508	4,857,778	4,872,024	4,886,640
4,830,747	4,858,388	4,872,495	4,886,915
4,833,881	4,859,081	4,873,315	4,887,240
4,834,281	4,859,135	4,873,624	4,887,603
4,835,686	4,859,643	4,874,465	4,887,958
4,836,797	4,859,888	4,874,598	4,888,481
4,837,745	4,859,924	4,874,617	4,888,512
4,838,025	4,860,007	4,874,741	4,892,733
4,838,136	4,860,110	4,874,808	4,893,284
4,838,615	4,860,402	4,874,812	4,894,509
4,838,680	4,860,935	4,875,262	4,895,574
4,839,661	4,861,380	4,875,266	4,922,113
4,839,795	4,861,719	4,875,692	4,926,041
4,840,297	4,862,003	4,875,700	4,948,887
4,843,540	4,862,612	4,875,879	
4,843,570	4,863,316	4,876,385	
4,844,425	4,863,471	4,876,386	

Disclaimers

Des. 279,294.—*William G. Davidson*, Elm Grove, Wisc. MOTORCYCLE ENGINE CYLINDER. Patent dated June 18, 1985. Disclaimer filed Aug. 16, 1990, by the assignee, Harley-Davidson, Inc.

The terms of this patent subsequent to February 26, 1999, has been disclaimed.

Des. 279,376.—*William G. Davidson*, Elm Grove, Wisc. MOTORCYCLE ENGINE HEAD. Patent dated June 25, 1985. Disclaimer filed Aug. 16, 1990, by the assignee, Harley-Davidson, Inc.

The terms of this patent subsequent to February 26, 1999, has been disclaimed.

Des. 303,571.—*Dan Akerfeldt*, Uppsala, Sweden. TISSUE SAMPLER. Patent dated Sept. 19, 1990. Disclaimer filed July 27, 1990, by the assignee, C.R. Bard, Inc.

Hereby enters this disclaimer to the claim of said patent.

Des. 306,070.—*Dan Akerfeldt*, Uppsala, Sweden. NEEDLE HEAD FOR BIOPSY CANNULA. Patent dated Feb. 13, 1989. Disclaimer filed July 27, 1990, by the assignee, C.R. Bard, Inc.

Hereby enters this disclaimer to the claim of said patent.

4,747,691.—*Robert O. Hoffland*, Conroe, Tex. METHOD AND APPARATUS FOR DILUTING AND ACTIVATING POLYMER. Patent dated May 31, 1988. Disclaimer filed May 11, 1990, by the inventor.

Hereby enters this disclaimer to claims 1 through 8 of said patent.

4,783,172.—*Raj P. Garg*, Patiala, India. RESPIROMETER. Patent dated Nov. 8, 1988. Disclaimer filed Dec. 27, 1989, by the inventor.

The term of this patent subsequent to Nov. 8, 2005, has been disclaimed.

4,812,221.—*Marc J. Madou*, Palo Alto; *Takaaki Otagawa*, Fremont, both of Calif. FAST RESPONSE TIME MICROSENSORS FOR GASEOUS AND VAPOROUS SPECIES. Patent dated March 14, 1989. Disclaimer filed March 26, 1990, by the assignee, SRI International.

The term of this patent subsequent to Sept. 14, 2005, has been disclaimed.

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	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 640-8847
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Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 455-8027
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PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF August 25, 1990

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director.	7-7-87
ORGANIC CHEMISTRY GROUP 120—JOHN F. TERAPANE, JR., Director.	11-21-88
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP— 130 BARRY S. RICHMAN, Director	5-12-88
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	12-14-88
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	4-23-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—ROBERT E. GARRETT, Director.	8-15-88
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	3-29-88
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	12-22-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director.	9-18-88
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP— 260 STEWART LEVY, Acting Director	4-25-88
DESIGN, GROUP 290—ROBERT E. GARRETT, Director	1-21-87
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MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	10-25-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director.	3-16-89
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350— A. L. SMITH, Director	10-1-89

Expiration of patents: The patents within the range of numbers indicated below expire during August 1990 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,750,192 to 3,755,818 inclusive
Plant Patents ..... 3,385 to 3,394 inclusive

REEXAMINATIONS

OCTOBER 9, 1990

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,794,732 (1365th)
RUMINANT FEED UTILIZATION IMPROVEMENT
Arthur P. Raun, New Palestine, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
Reexamination Request Nos. 90/001,073, Aug. 22, 1986 and 90/001,104, Oct. 3, 1986.
Reexamination Certificate for Patent No. 3,794,732, issued Feb. Filed Aug. 22, 1986, Ser. No. 220,304
Int. Cl.[5] A61K *31/35*
U.S. Cl. 514—460

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–7 are cancelled.

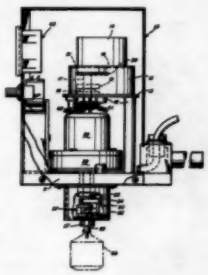
[1. A method of increasing the efficiency of feed utilization of ruminant animals having a developed rumen function which comprises the oral administration to such animals of a propionate-increasing amount of an antibiotic chosen from the group consisting of X537A and its physiologically acceptable esters and salts.]

B1 4,448,061 (1366th)
VISCOMETER WITH A CONTINUOUSLY VARIABLE ELECTRONIC READOUT
David A. Brookfield, 168 Massapoag Ave., Sharon, Mass. 02067
Reexamination Request No. 90/001,975, Mar. 26, 1990.
Reexamination Certificate for Patent No. 4,448,061, issued May 15, 1982, Ser. No. 385,576, Jun. 7, 1984.
Int. Cl.[5] G01N *11/14*
U.S. Cl. 73—59

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–4 is confirmed.

1. A viscometer for use in continuously monitoring the viscosity of a liquid, said viscometer including a rotatable drive unit, means to rotate said unit, a rotatable driven unit coaxial with said first mentioned drive unit and provided with an element to be immersed in the liquid the viscosity of which is to be monitored, and to be subjected to drag which increases as the viscosity of the liquid increases, resiliently yieldable means connecting said unit enabling the drive unit to rotate the drive unit but with the connecting means yielding as the drag increases, and an electric circuit including an electronic readout having a plurality of leads and a transducer having a stator included in said drive unit and a rotor included in said driven unit, said stator having a plurality of leads each including a slip ring, one for each of said readout leads and said readout leads including brushes, one for each slip ring and in contact therewith, said transducer providing a variable signal continuously to said readout to which said readout responds and which varies in strength immediately with any variations in the viscosity of the liquid.



REISSUES

OCTOBER 9, 1990

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,370
STAMP FORMED MUFFLER

Jon Harwood, Toledo, Ohio, assignor to AP Parts Manufacturing Company, Toledo, Ohio

Original No. 4,700,806, dated Oct. 20, 1987, Ser. No. 934,642, Nov. 25, 1986. Application for reissue May 10, 1989, Ser. No. 350,136

Int. Cl.[5] F01N *1/02, 7/18*

U.S. Cl. 181—282 **25 Claims**

1. A muffler for mounting to at least one exhaust pipe and at least one tail pipe of a vehicle, said muffler comprising a pair of plates securely connected to each other in generally face to face *abutting* relationship, each of said plates being stamp formed to define an array of channels therebetween, said channels being configured to define at least one inlet tube and at least one outlet tube in communication with one another and connectable to the exhaust pipe and tail pipe respectively, said inlet and outlet tubes each including at least one array of perforations extending therethrough, said arrays of channels further defining at least one tuning tube *of a selected length* in communication with at least one of said inlet and outlet tubes, *the length of the tuning tube extending along the abutting surfaces of the internal plates,* said muffler further comprising at least one stamp formed external shell securely mounted to said plates, said external shell being stamp formed to define: inlet and outlet openings surrounding and mounted to selected portions of said inlet and outlet tubes respectively, at least one chamber enclosing the arrays of perforations in said plates, and at least one stamp formed low frequency resonating chamber in communication with the tuning tube formed by the plates.

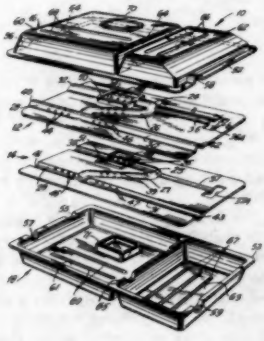
Re. 33,371
METHOD AND MATERIAL FOR DENTAL STRUCTURES

Itzhak Shoher, 50 Shlomo Hamelich Street, Tel Aviv, and Aharon Whiteman, 13 J1 Perez Street, Petach Tikvah, both of Israel

Original No. 4,742,861, dated May 10, 1988, Ser. No. 937,011, Dec. 2, 1986. Continuation-in-part of Ser. No. 723,063, Apr. 7, 1985, Pat. No. 4,814,008. Application for reissue Jul. 3, 1989, Ser. No. 375,031

Int. Cl.[5] B22D *19/10*

U.S. Cl. 164—80 **11 Claims**



1. A method for forming, reinforcing, or repairing a dental restoration comprising forming a material composition of metal particles composed substantially of a high fusing temperature metal component and a low fusing temperature component [with the low fusing component being in a mirror proportion relative to the high fusing temperature component]; adding the material to the dental restoration to be reinforced or repaired; molding the material composition into a predetermined shape; heat treating the material composition at a temperature below the melting temperature of said high fusing temperature metal component and at a temperature level sufficient to cause substantial melting of said low fusing temperature component for forming a porous sponge-like mass of interconnected particles of said high fusing temperature metal component; adding particles of a low melting temperature filler to said porous sponge-like mass of metal, and heat treating said filler particles to cause said filler particles to melt into the sponge-like mass whereby a solid reinforced structure is formed.

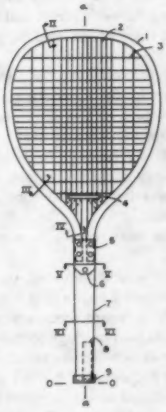
Re. 33,372
TENNIS RACKET

Jack L. Frolow, 448 Dewey St., Long Branch, N.J. 07740

Original No. 4,690,405, dated Sep. 1, 1987, Ser. No. 543,431, Oct. 19, 1983. Application for reissue Aug. 24, 1989, Ser. No. 398,263

Int. Cl.[5] A63B *49/04*

U.S. Cl. 273—73 C **57 Claims**



47. A complete tennis racket having at least a head portion and a handle portion, said handle portion having a grip portion suitably adapted for the hand to grip, the end of the grip portion being located at the handle portion end of the racket; said head portion supporting a string netting in a plane; said netting having vertical and horizontal strings; said racket having a longitudinal axis running from the center of the grip portion end of the racket to the center of the head portion end of the racket; said racket having a weight distribution providing for the moment of inertia Ia in ounce inches squared about said longitudinal axis; said racket having a weight and stiffness distribution providing a frequency of vibration f_1 in cycles per second when tested in accordance with test 13 of FIG. 15 herein before defined; said racket having a length L in inches from the end of the grip portion to the end of the head portion; said racket characterized in that the magnitude of Ia is greater than 80 ounce inches squared; and the magnitude of f_1 is greater than 160 cycles per second and said length L is greater than 25.5 inches.

Re. 33,373

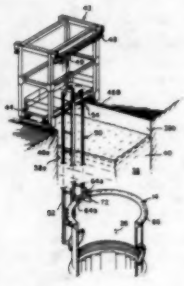
TOOLING APPARATUS FOR MODIFYING NUCLEAR REACTORS

Frank G. Gallo, Mt. Airy, Md.; Clark E. Swenson, Orchard Park, N.Y.; William A. Bencloski, Hermine, Pa.; Angelo J. Cassette, Greensburg, Pa.; John L. Mano, White Oak, Pa., and Edward A. Parlak, North Huntingdon, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Original No. 4,716,010, dated Dec. 29, 1987, Ser. No. 561,018, Dec. 13, 1983. Application for reissue Aug. 12, 1988, Ser. No. 231,403

Int. Cl.[5] **G21C** *19/02*

U.S. Cl. 376—260 **21 Claims**



1. Support apparatus for supporting and selectively locating a tool with respect to its work piece, and the work piece having first and second dimensions, said support apparatus comprising:

(a) a tool carriage for receiving the tool;

(b) a support structure for supporting and guiding said tool carriage with respect to the workpiece;

(c) first drive means mounted on said support structure and coupled to said tool carriage for selectively driving said tool carriage along said first dimension;

(d) rail means mounted on said tool carriage along said second dimension;

(e) a support table mounted for movement along said rail means;

(f) [second drive means mounted on said tool carriage selectively driving the tool along said second dimension, said] second drive means mounted on said support table and engaging said tool carriage to drive said support table along said rail means, whereby the tool may be accurately positioned with respect to the work piece; and

(g) clamp means affixed to said support structure for engaging the work piece for suspending said support structure, whereby said support structure extends along said first dimension of said work piece.

Re. 33,374

FORCED AIR/GAS BURNER AND BAKING OVEN INCORPORATING SAME

Amal C. Bhattacharjee, Jackson Heights, N.Y., assignor to Nabisco Brands, Inc., East Hanover, N.J.

Original No. 4,615,895, dated Oct. 7, 1986, Ser. No. 724,553, Apr. 18, 1985. Application for reissue May 22, 1987, Ser. No. 53,129

Int. Cl.[5] **A21D** *8/06*

U.S. Cl. 426—523 **20 Claims**

1. A baking oven comprising:

a housing having walls defining a chamber;

transport means for moving articles to be baked through the chamber; and

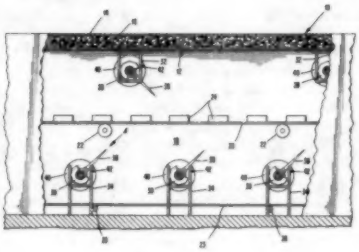
a plurality of gas burners mounted within the chamber and spaced from one another, at least one of the gas burners comprising:

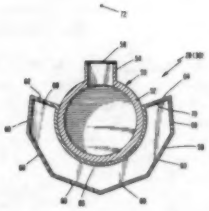
a gas supply conduit;

walls defining an elongate gas plenum communicating with the gas supply conduit, and also defining a row of gas apertures spaced from one another along the length of the gas plenum and extending *parallel to one another* from the gas plenum to the external surface of the gas burner, such that gas issuing from these gas apertures will burn to produce a *substantially planar* flame extending along the length of the gas burner;

an air supply conduit; and

walls defining at least one air plenum communicating with the air supply conduit, and also defining two rows of air apertures extending from the at least one air plenum to the external surface of the gas burner, the two rows of air apertures being disposed on opposed sides of the row of gas apertures, *the air apertures in each row extending parallel to one another,* the two rows of air apertures being directed towards the [row of gas apertures] *plane of the gas flame at equal angles in the range of about 10° to about 30° to this plane but from opposed sides of this plane* such that *the two jets of* air issuing from the two rows of apertures will impinge *symmetrically* upon the flame [produced by the gas issuing from the row of gas apertures] *from opposed sides thereof* and lengthen this flame.





7. A process for baking dough goods, which process comprises:

transporting the dough goods through a baking oven provided with a plurality of gas burners each having a row of gas apertures, *the row of gas apertures extending parallel to one another;*

supplying gas to the gas burners, whereby a stream of gas passes through the gas apertures and burns adjacent the gas burner *to produce a substantially planar flame extending along the length of the gas burner;* and

in at least one of the gas burners, directing two streams of air from opposed sides of the flame produced by the burning gas inwardly towards the flame, [each stream] *the two streams* of air being directed at [an] *equal* acute [angle] *angles in the range of about 10° to about 30°* to the [direction] *plane* of the gas [issuing from the gas apertures]

flame but from opposed sides of this plane, thereby causing the streams of air to impinge upon and lengthen the flame.

Re. 33,375

TREATMENTS EMPLOYING DRUG-CONTAINING MATRICES FOR INTRODUCTION INTO CELLULAR LESION AREAS

Edward E. Lack, and Dennis M. Brown, both of Menlo Park Calif., assignors to Matrix Pharmaceuticals, Inc., Menlo Park, Calif.

Original No. 4,619,913, dated Oct. 28, 1986, Ser. No. 736,496, May 21, 1985. Continuation-in-part of Ser. No. 615,008, May 29, 1984, abandoned. Application for reissue Oct. 11, 1988, Ser. No. 255,863

Int. Cl.[5] A61K *9/00, 9/26, 9/22, 31/28*

U.S. Cl. 514—2 **16 Claims**

1. A proteinaceous composition comprising from 30% to 95% of collagen and/or fibrinogen dispersed in an aqueous medium as an amorphous flowable mass at a concentration of from about 5 to 75 mg/ml and from about 0.1 to 50 weight percent based on said collagen and/or fibrinogen of a cytotoxic drug *or proliferation inhibitor.*

Re. 33,376

NON-FOIL COMPOSITE STRUCTURES FOR PACKAGING JUICE

Charles E. Gibbons; Cynthia L. Tanner, and Allan A. Whillock, all of Mobile, Ala., assignors to International Paper Company, Purchase, N.Y.

Original No. 4,789,575, dated Dec. 6, 1988, Ser. No. 55,629, May 29, 1987. Continuation of Ser. No. 373,964, Jun. 27, 1989, abandoned. Application for reissue Nov. 13, 1989, Ser. No. 434,636

Int. Cl.[5] B65D *85/00*

U.S. Cl. 428—34.2 **42 Claims**

1. A container for liquids containing essential oils and flavors, *said container having an interior and an exterior,* said container constructed from a laminate comprising:

(a) a paperboard substrate *with inner and outer surfaces, said inner surface being closer to the interior of the container than said outer surface;*

(b) a 12 lb. outer layer of a heat-sealable low density polyethylene polymer [coated on] *exterior to* to said outer surface of said paperboard substrate;

(c) [an inner] *a coextruded* sandwich layer comprising a 4.5 lb. tie layer, a 4.0 lb. heat-sealable ethylene vinyl alcohol copolymer layer and a 4.5 lb. tie layer [extruded on] *interior to* said inner surface of said paperboard substrate; and

(d) a product-contact layer of a 10 lb. heat-sealable low density polyethylene polymer [coextruded onto] *interior to* said outer surface of said inner sandwich layer of tie layer—ethylene vinyl alcohol copolymer—tie layer whereby said laminate can be heat-sealed on conventional equipment at temperatures ranging from 250° F–500° F.

Re. 33,377

METHOD OF PREPARING SULFUR-MODIFIED POLYCHLOROPRENE

Paul Branlard, Grenoble, and Jean-Pierre Merle, Echirolles, both of France, assignors to Distugil, Neuilly-sur-Seine, France

Original No. 4,255,539, dated Mar. 10, 1981, Ser. No. 89,732, Oct. 31, 1979. Continuation of Ser. No. 117,405, Nov. 2, 1987, abandoned, which is a continuation of Ser. No. 506,788, Jun. 22, 1983, abandoned. Application for reissue Oct. 20, 1988, Ser. No. 262,187

Int. Cl.[5] G08F *8/00, 8/34*

U.S. Cl. 525—345 **21 Claims**

1. A method of preparing sulfur-modified polychloroprene by copolymerization of chloroprene *and an ethylenically unsaturated copolymerizable monomer* with sulfur, in alkaline aqueous emulsions and in the presence of a free-radical initiator, at least one organic [polysulfides] *polysulfide* selected from the class consisting of:

(a) di- and tetra-alkylthiuram disulfides in which the alkyl group contains from about 3 to 5 carbon atoms;

(b) benzothiazyl disulfide;

(c) benzyl polysulfides in which the number of sulfur atoms is equal to or greater than 3;

(d) 2,4,5-trichlorophenyl trisulfide; and

(e) benzanilide disulfide [and] the said polysulfide [is] *being* introduced before the initiation of the polymerization in proportions of between about 0.1 and 2 parts to 100 parts, by weight, or chloroprene charged, *and the ethylenically unsaturated copolymerizable monomer being present at up to about 20% by weight of chloroprene.*

Re. 33,378

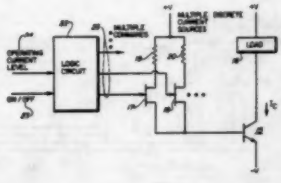
INCREMENTAL BASE DRIVE CIRCUIT FOR A POWER TRANSISTOR

Byron R. Mehl, Belvidere, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Original No. 4,609,832, dated Sep. 2, 1986, Ser. No. 542,147, Oct. 14, 1983. Application for reissue May 15, 1989, Ser. No. 352,158

Int. Cl.[5] H03K *17/08*

U.S. Cl. 307—270 **10 Claims**



1. A base drive circuit for a power transistor having base, collector and emitter elements and a load circuit connected in series with the collector and emitter elements, comprising:

a source of control signal which represents an operating current level of said transistor wherein said control signal is a digital signal;

a plurality of discrete current sources for providing increments of base current to the base element of said transistor; and

means responsive to said control signal for connecting a controlled number of said discrete current sources with the base element of said transistor to provide the desired base current dependent on the operating current level.

Re. 33,379

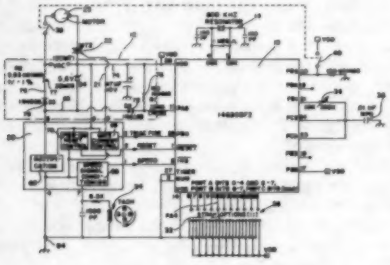
MICROPROCESSOR BASED MOTOR CONTROL

Robert Bradus, Bel Air, Md., assignor to Black & Decker Inc., Newark, Del.

Original No. 4,628,233, dated Dec. 9, 1986, Ser. No. 784,702, Oct. 4, 1985. Continuation of Ser. No. 592,809, Mar. 23, 1984, abandoned. Application for reissue Dec. 9, 1988, Ser. No. 283,263

Int. Cl.[5] H02P 7/28

U.S. Cl. 388—802 **47 Claims**



40. The method of detecting an impending kickback condition in a motor-driven tool comprising the steps of:

determining a first value indicative of the rotational speed of the motor at a first point in time;

determining a second value indicative of the rotational speed of the motor at a second point in time a predetermined period of time after said first point in time;

determining when said second value is less than said first value by a predetermined percentage; and

producing a predetermined action in response thereto.

Re. 33,380

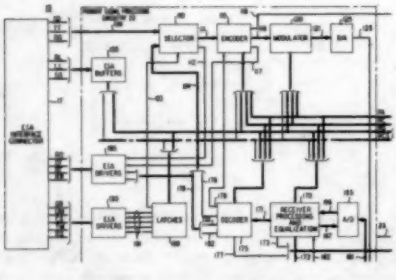
VOICEBAND DATA SET

Enrique Cheng-Quispe, Marlboro; Thomas M. Dennis, Ocean; Emanuel J. Fulcomer, Jr., Little Silver; George Malek, Wayside, all of N.J., and Shih Y. Tong, Taipei, Taiwan, assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Original No. 4,419,756, dated Dec. 6, 1983, Ser. No. 156,869, Jun. 5, 1980. Application for reissue Dec. 6, 1985, Ser. No. 806,266

Int. Cl.[5] H04B 1/38

U.S. Cl. 375—7 **61 Claims**



48. A data set for processing data applied to said data set to generate transmit data signals representing said data, said data set characterized by

signal processing means which includes a plurality of addressable registers,

a bus common to said registers, and

controller means for addressing said registers and for writing into each register via said bus at least a first associated information signal, the values of the information signals in said registers specifying the manner in which said data are to be processed,

said signal processing means further including circuit means distinct from said controller means for processing said data in accordance with said information signal values to generate said transmit data signals, and means for applying said transmit data signals to a transmission line.

Re. 33,381

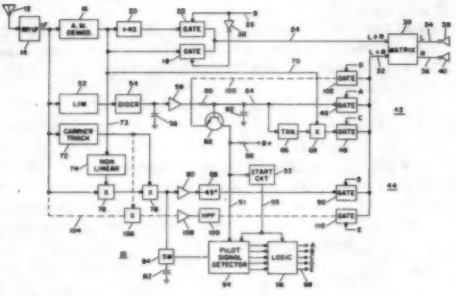
MULTIPLE SYSTEM AM STEREO RECEIVER AND PILOT SIGNAL DETECTOR

Leonard R. Kahn, 137 E. 36th St., New York, N.Y. 10016

Original No. 4,426,728, dated Jan. 17, 1984, Ser. No. 298,230, Aug. 31, 1981. Application for reissue Jan. 15, 1986, Ser. No. 819,162

Int. Cl.[5] H04H 5/00

U.S. Cl. 381—15 **18 Claims**



1. In a receiver for stereophonic broadcast signals which include a modulation component comprising a pilot signal having a selected frequency characteristic, apparatus for determining the presence or absence of said pilot signal, comprising:

means for detecting received signal components which lie within a first band of frequencies which includes said pilot signal, and for also detecting received signal components which lie within at least one other band of frequencies located above or below said first band;

and means for evaluating the signals detected in said first and other bands, and for developing [an] *a binary* output signal which indicates when signals in said first band exceed a first level and signals in said other band do not exceed a second level.

18. A multiple-system AM stereo receiver for receiving and demodulating composite amplitude-modulated (AM) stereophonic broadcast signals which comprise a carrier having amplitude modulation, representative of stereo sum (L+R) information, and angular modulation, representative of stereo difference information, impressed on said carrier according to either of at least two different composite modulation techniques, said angular modulation further including a pilot signal component having a selected frequency characteristic representative of the particular one of said composite modulation techniques used to develop the broadcast signal, said receiver comprising:

means for receiving composite AM stereo radio frequency (RF) signals and for converting said RF signals to corresponding intermediate frequency (IF) signals;

means for detecting the presence of AM stereo pilot signal components in said received signals and determining the frequency characteristic of said pilot signals, and for developing at least one control signal when the presence of a pilot signal is detected, said control signal being indicative of the particular composite modulation technique represented by said pilot signal;

decoding means, capable of operating in different modes appropriate for amplitude and angular demodulation of IF signals corresponding to at least two of said different composite

modulation techiques, said different modes being selectable in response to said control signal, for appropriately demodulating said IF signal to develop a pair of output signals representative of (L+R) and (L−R) information, respectively, when said control signal indicates reception of an AM stereo signal corresponding to either one of said composite modulation techniques;

and means, responsive to said (L+R) and (L−R) representative signals, for deriving left (L) and right (R) stereo audio output signals therefrom.

PLANT PATENTS

GRANTED OCTOBER 9, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,347

ROSE PLANT—MEINABRON VARIETY

Marie Louise Meilland, deceased, late of Antibes, France (by Jean-Pierre Le Naour, legal representative), assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Mar. 9, 1989, Ser. No. 321,143
Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—8 **1 Claim**

1. A new and distinct variety of Miniature rose plant characterized by the following combination of characteristics:
(a) forms in abundance on a continuous basis attractive long lasting blossoms which are white in coloration and possess firm petals,
(b) forms green adult wood,
(c) exhibits a vigorous growth habit,
(d) exhibits a bushy configuration, and
(e) is well suited for pot forcing;
substantially as herein shown and described.

7,348

BILL HENGST OCTOBER GEM PLUM

William E. Hengst, 18656 Avenue 296, Exeter, Calif. 93221

Filed Feb. 21, 1990, Ser. No. 483,610
Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct varieyt of plum tree as described and illustrated and identified by the characteristics enumerated above. a

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7,349

GERBERA PLANT 'TEDSKE'

Th. A. Segers, Hoofddorp, Netherlands, assignor to Twyford Plant Laboratories, Inc., Santa Paula, Calif.

Filed Feb. 28, 1989, Ser. No. 317,168
Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. The new distinct variety of Gerbera plant herein described and illustrated and identified by the characteristics enumerated above.

7,350

GERANIUM PLANT "MISTY"

Richard Craig, and Leon Glicenstein, both of State College, Pa., assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

Filed May 3, 1989, Ser. No. 347,102
Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Geranium substantially as illustrated and described, characterized as being particularly well adapted to both commercial greenhouse production as well as garden performance, and as being early flowering, floriferous, self-branching, compact, heat-tolerant and low-light-tolerant.

7,351

GERANIUM PLANT #821-(82-116-13)

Richard Craig, and Leon Glicenstein, both of State College, Pa., assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

Filed May 3, 1989, Ser. No. 347,103
Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Geranium substantially as herein shown and described, characterized as being particularly well adapted to both commercial greenhouse production as well as garden performance, and as being early flowering, floriferous, self-branching, compact, heat-tolerant and low-light-tolerant.

7,352

VARIETY OF GERANIUM NAMED MIMI

Jacques Guillou; Bernard Guillou, and Maurice Guillou, all of Saint-Malo, France, assignors to Etablissement Guillou Freres Jacques, Bernard et Maurice, France

Filed May 31, 1989, Ser. No. 359,877
Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of ivy Geranium plant as shown and described herein and characterized by substantive improvement over the current commercial counterpart "Beauty of Eastbourne", being much more vibrant, a much fuller plant habit; more cuttings which root more quickly and a much greater tolerance to heat.

7,353

VARIETY OF GERANIUM NAMED RENEE

Jacques Guillou; Bernard Guillou, and Maurice Guillou, all of Saint-Malo, France, assignors to Etablissement Guillou Feres Jacques, Bernard et Maruice, France

Filed May 31, 1989, Ser. No. 359,835
Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of ivy Geranium plant as shown and described herein and characterized by single red florets that accent the medium green foliage, less likely to show signs of petal burn, the plant habit and form is very compact which creates a better cutting producer as well as creating a uniform plant, and it stands up well outdoors in very high temperatures and is self-cleaning.

PATENTS

GRANTED OCT. 9, 1990

ERRATA

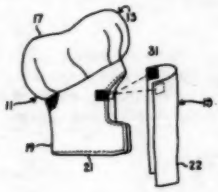
For CLASS	See PATENT NO.
052-747	4,961,258
131-332	4,961,415
606-180	4,961,421
165-063	4,961,455
141-001	4,961,456
175-170	4,961,471
221-129	4,961,507
222-181	4,961,508
177-025	4,961,533
408-144	4,961,672
415-170	4,961,678
433-086	4,961,698
261-142	4,961,885
422-116	4,961,915
422-088	4,961,916
435-069	4,961,969
436-084	4,961,970
435-252	4,962,055
503-200	4,962,072
419-019	4,962,084
514-030	4,962,146
558-408	4,962,223
514-399	4,962,278
501-150	4,962,279
502-439	4,962,280
528-413	4,962,281
562-825	4,962,282
564-063	4,962,283
564-194	4,962,284
392-484	4,962,296
361-056	4,962,320
290-048	4,962,340
323-360	4,962,354
340-619	4,962,395
335-201	4,962,406
335-208	4,962,407
335-245	4,962,408
362-268	4,962,450

PATENTS

GRANTED OCTOBER 9, 1990

GENERAL AND MECHANICAL

4,961,232
UNDERHOOD HAVING COMBINED SKIRT AND RELEASE MEANS
David A. Hulsey, Meridian, Id., assignor to Micron Technology, Inc., Boise, Id.
Filed Jun. 26, 1989, Ser. No. 371,319
Int. Cl.[5] A42B *1/18*
U.S. Cl. 2—206 **14 Claims**



1. Cleanroom garment for protecting an environment from contamination from the wearer's head and face, characterized by:

(a) a bonnet part constructed to cover most of the user's scalp hair and fit loosely, and having a lower open end fitted to encircle the wearer's scalp in the manner of a brim hat;

(b) the bonnet part being constructed of fabric which is selected to have a maximum degree of breathability of humid air, and which has a porosity which does not exceed that required to block cleanroom contaminants from escaping from the wearer's body through the bonnet part;

(c) a face skirt part attached to the lower bonnet part and substantially encircling the wearer's head, the lower open end of the bonnet part and said attachment to the lower open end of the bonnet part being effected so as to seal the lower open end of the bonnet part against the face skirt part;

(d) the face skirt part extending from the lower open end of the bonnet part to a location below the wearer's head, thereby permitting the face skirt part to be tucked beneath a shirt garment worn by the user;

(e) the face skirt part being constructed of fabric having an elastic property, so that the face skirt conformally fits against the wearer's scalp at the location of the attachment of the face skirt part to the lower open end of the bonnet part;

(f) the encirclement of the face skirt part around the wearer's head discontinuing below the attachment to the lower open end of the bonnet;

(g) the face skirt part being constructed of fabric which is selected to have an ability to wick moisture from the user's skin, while retaining breathability of humid air, and which has a porosity which does not exceed that required to block cleanroom contaminants from escaping from the wearer's body through the face skirt part;

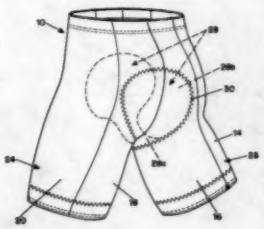
(h) a face mask, the face mask being constructed of fabric which is selected to have an ability to wick moisture from the user's skin, while retaining breathability of humid air, and which has a porosity which does not exceed that required to block cleanroom contaminants from escaping from the wearer's body through the face mask;

(i) the face mask being constructed of substantially non-elastic fabric which is selected to have an ability to wick moisture from the user's skin, while retaining breathability of humid air, and which has a porosity which does not exceed that required to block cleanroom contaminants from escaping from the wearer's body through the face skirt part; and

(j) attachments for attaching the face mask to the face skirt part, including at least one adjustable attachment, the attachments located on the face skirt at positions such that the wearer, upon securing the face mask across the face, will position the face mask properly by securing the face mask for comfort;

(k) the cleanroom garment providing an elastic bias of the face mask across the wearer's face, the elastic bias of the face skirt part providing a desired tension across the face mask which is adjustably established by said securing the face mask across the face by means of said adjustable attachment, the elastic bias being effected without deformation of the face mask around the wearer's face, although the elastic property permits the face skirt to stretch during movement of the wearer.

4,961,233
CYCLING PANTS
Graham Black, Monroe, Conn., assignor to Cannondale Corporation, Georgetown, Conn.
Filed Dec. 4, 1989, Ser. No. 445,973
Int. Cl.[5] A41D *1/08*
U.S. Cl. 2—228 **4 Claims**



1. Cycling pants having a liner of a strong, soft, supple, non-extensible fabric material formed primarily of thermoplastic fiber elements and stitched along its perimeter to the pants, the liner consisting of a front portion located in generally the lower abdominal region, a rear portion located in generally the buttocks region and a perineal portion in the perineal region, characterized in that the liner is a single piece of material free of seams and heat-formed to impart a generally form-fitting shape in which the front portion curves sharply upwardly relative to the perineal portion, the rear portion and perineal portion are moderately concavely curved upwardly, and both lateral margins curve donwardly, diverge anteriorly and posteriorly and diminish progressively in curvature in the front and rear portions.

4,961,234
OUTERGARMENT WITH DETACHABLE CROTCH PIECE
Faith H. Leibman, 304 Melrose Rd., Merion, Pa. 19066
Filed Mar. 24, 1989, Ser. No. 328,288
Int. Cl.[5] A41D *1/06*
U.S. Cl. 2—234 **13 Claims**

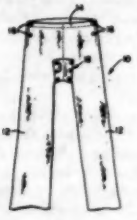
1. An outergarment for hiking or camping that eliminates the need for a separate undergarmet comprising:

a waistband;

leg receiving portions coupled to said waistband and having leg openings therein;

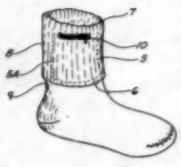
a detachable crotch piece being made of a washable material

and being completely removable from said outergarment, said crotch piece including an outer layer which comprises two curved pieces, said pieces being connected to each other along their inner curved edges by a seam so that said outer layer follows the contour of the crotch; and



means for releasably connecting said crotch piece to said outergarment, said releasable connecting means being disposed adjacent to the outer curved edges to said curved pieces and to said leg portions of said outergarment.

4,961,235
SOCK WITH POCKET AND RELATED METHOD
Karen S. Williger, 716 Michelle Court, Gretna, La. 70056
Filed Apr. 27, 1989, Ser. No. 344,314
Int. Cl.[5] A41B *11/00*
U.S. Cl. 2—239 **30 Claims**



1. A method for fabricating a pocket having an inner wall and an outer wall in a sock or other item or hosiery having a calf area, comprising the following steps:

a. making an opening in the calf area of said hosiery item defining an upper and a lower calf portion,

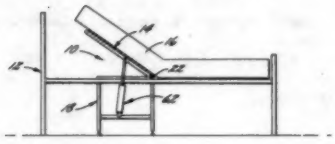
b. folding said upper calf portion and part of said lower calf portion including said opening, forming a fold above said opening such that said opening is juxtaposed to and is located below said fold, and an unfolded lower calf portion forms an inner wall behind said opening, and the folded portion of said calf area forms an outer wall,

c. sewing said upper calf portion of said inner wall below said opening about said outer wall, and

d. providing closure means for closing said opening, said closure means allowing said opening to be opened or closed on demand.

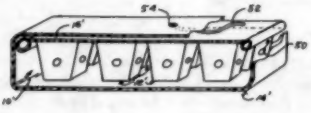
4,961,236
MATTRESS POSITION ADJUSTMENT DEVICE
Lanzo E. Luconi, P.O. Box 44-1000, San Jose, Costa Rica
Filed Jan. 2, 1990, Ser. No. 459,435
Int. Cl.[5] A61G *7/06*
U.S. Cl. 5—71 **4 Claims**

1. A device for use with an existing bedframe, said device comprising a lifting frame for raising and lowering a portion of a mattress supported thereby; hinge means pivotally joining said lifting frame at a free end thereof to a support frame comprising a plurality of leg members and crossbar members connecting said leg members; said crossbar members comprising an upper crossbar member and a lower crossbar member; said hinge means being fixedly attached to said upper crossbar member, which has an elongated opening through which extends fluid operated motive means supported by and pivotally joined to said lower crossbar member on the respective side of



said support frame, the motive means being pivotally joined to and directly connected to said lifting frame, said elongated opening providing for angular movement of said motive means as said lifting frame is raised and lowered by said motive means.

4,961,237
DEVICE FOR REDUCING WAVE MOTION IN A WATERBED MATTRESS
Philip J. Santo, 12 Mountain Rd., Rochester, N.Y. 14625
Continuation-in-part of Ser. No. 158,642, Feb. 19, 1988, abandoned. This application May 30, 1989, Ser. No. 357,799
Int. Cl.[5] A47C *27/08*
U.S. Cl. 5—450 **13 Claims**



1. In a waterbed mattress free of water absorbing foam or fibrous materials including a bladder adapted to contain water, a device located within such bladder for reducing wave motion of water within such bladder, said wave reducing device comprising:

at least one compartment including a top wall, a bottom wall, and a marginal perimeter wall interconnecting said top wall and said bottom wall to form an enclosed chamber;

said bottom wall and said marginal perimeter wall respectively defining at least one opening therethrough, said openings being of a dimension to enable a minimum fluid flow into and out of said chamber and substantially restrict transient fluid flow into and out of said chamber; and

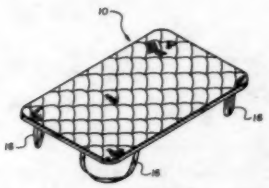
a buoyant insert operatively connected to said top wall to urge said compartment toward the top of such bladder, said buoyant insert including a nonabsorbing, water compatible member having a plurality of air entrapping hemispherical cells of uniform size.

4,961,238

INSULATING COVERLET FOR CONVENTIONAL WATERBEDS

Garth J. Limb, and Sandra L. Limb, both of 7156 S. 1115 West, West Jordan, Utah 84084

Continuation-in-part of Ser. No. 94,038, Aug. 31, 1987, Pat. No. 4,754,514, which is a continuation of Ser. No. 846,131, Mar. 31, 1986, abandoned. This application Jul. 1, 1988, Ser. No. 214,337
The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.
Int. Cl.[5] E04H *3/19*; B32B *3/02, 5/02, 5/18*
U.S. Cl. 5—500 **7 Claims**



1. A thermal insulating layered cover especially adapted to fit a filled waterbed bladder comprising a bladder cover for a large conventional waterbed bladder consisting essentially of:

a rectangular flexible lightweight foam pad underlay having a minimal thickness of at least about one-fourth inch and a maximum thickness of about one inch;

a rectangular layer of hollow, polyester insulating fibers having a minimum thickness of at least three-eights inch and a maximum thickness of about two inches, said layer of fibers superposed upon said foam pad;

a fabric overlay attached to said layer of insulating fibers to form an upper surface for the cover; and

loop-like bladder attachment means attached near each corner of said cover to secure said cover to said bladder, and said layer of insulating fibers quilted to said foam pad and to said fabric overlay to form an integral, sandwich-type unit, said integral unit having an over-all thickness of at least about three-quarter inch and a maximum thickness of about three and one-half inches, said cover sized to fit the upper surface of a large conventional waterbed bladder.

4,961,239

FIXED YET PIVOTABLE KNIFE OR TOOL

Frank M. Boyd, Sr., Saugus, and Francis M. Boyd, Jr., San Francisco, both of Calif., assignors to F. Boyd, Ltd., Limited Partnership, San Francisco, Calif.

Filed Aug. 22, 1988, Ser. No. 234,608
Int. Cl.[5] B25F *1/04*
U.S. Cl. 7—118 **42 Claims**

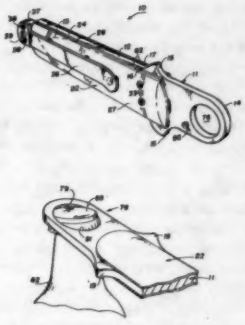
1. A pivotable yet fixed-member tool comprising

a pair of longitudinally-extending scales at least a first of said scales including opposing edges,

a tool member having sides and having an aperture therein disposed between said scales, said tool member pivotable into one or the other of directions corresponding to the directions for the longitudinally-extending scales,

means for urging said tool member in said one of said directions, said scales including slots in alignment with such aperture,

means for pivoting said tool member about said scales mounted in said slots and aperture, and



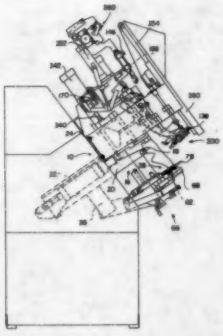
means for retaining said tool member in a locked position relative to said scales as a result of urging by said urging means.

4,961,240

BACKPART MOULDING AND HEEL SEAT LASTING MACHINE

Marinus E. Schuurmans, Waalwijk, Netherlands, assignor to British United Shoe Machinery Ltd., Leicester, England

Filed Mar. 7, 1989, Ser. No. 320,174
Claims priority, application United Kingdom, Mar. 31, 1988, 8807667
Int. Cl.[5] A43D *21/08, 21/00*
U.S. Cl. 12—12.5 **65 Claims**



1. A backpart moulding and heel seat lasting machine comprising

a shoe support for supporting, bottom uppermost, a shoe comprising a shoe upper on a last and an insole on the last bottom, said support comprising a last pin which is received in a last pin hole formed in the crown of the last,

a holddown, by which the heightwise position of the heel seat of a shoe supported by the shoe support is determined, the shoe support also comprising means for moving the last pin heightwise into and out of an operative position determined by the engagement of the heel seat of said shoe with the holddown,

a heel band assembly, comprising a heel band which provides a moulding surface shaped complementarily to the heel end of the shoe to be operated upon and by which said heel end can be clamped and moulded, and

a wiper assembly, comprising a pair of wiper plates and

means for effecting forward and inward movement thereof whereby the wiper plates are effective to cause heel seat lasting marginal portions of the upper of a shoe the heel end of which has been clamped as aforesaid to be wiped over and pressed against corresponding marginal portions of the insole of said shoe whereby, with adhesive applied therebetween, said marginal portions are bonded together, said means also being effective to cause the wiper plates to be retracted at the end of their operation, and the arrangement being such that, with the wiper plates in an inwiped position, the holddown is retracted and increased pressure is applied to the shoe support thus to apply a bedding pressure to said marginal portions,

wherein the heel band assembly and the wiper assembly are supported by a support arrangement, means being provided for effecting relative movement of approach between the shoe support and said support arrangement, to cause the heel end of a shoe supported by the shoe support to be engaged by the heel band, thus determining an operative relationship between the shoe support and the support arrangement, and for effecting relative movement of separation therebetween to a spaced relationship to facilitate the loading of a shoe on the shoe support,

and further wherein the means for effecting heightwise movement of the last pin as aforesaid is effective to move the last pin in a direction away from the wiper plates out of its operative position prior to relative movement of separation being initiated between the shoe support and the support arrangement.

4,961,241

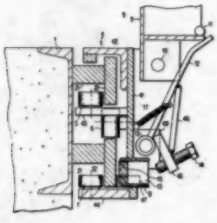
BRAKE FOR RAIL DOCK LEVELER

James C. Alexander, London, Canada, assignor to The Serco Corporation, Ontario, Canada

Filed Jun. 29, 1989, Ser. No. 372,977

Int. Cl.[5] E01D *1/00*

U.S. Cl. 14—69.5 **9 Claims**



1. Apparatus comprising:

a base, a rail means mounted to said base,

a carriage mounted on said rail means for movement relative to said base.

a dockboard mounted to said carriage, said dockboard stored in a generally vertical inoperative position and movable downward into a generally horizontal operative position,

actuating arm means pivotably connected to said carriage and movable in response to movement of said dockboard from said inoperative to said operative position, and

brake means mounted on said carriage and responsive to movement of said actuating arm means wherein said brake means is urged into contact with said rail means when said dockboard is in said operative position to prevent movement of said carriage relative to said base.

4,961,242

WET MOP HEAD FOR FLOOR MOP

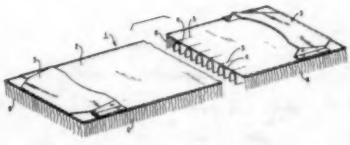
Franz Kresse, Hilden; Rainer Osberghaus, Duesseldorf; Bernfrid Scheller, Pulheim; Roland Schunter, Lorch-Waldhausen, and Herta Tuchermann, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Filed Mar. 16, 1989, Ser. No. 324,478

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1988, 3809279

Int. Cl.[5] A47L *13/20*

U.S. Cl. 15—228 **18 Claims**



1. An absorption head for a wet floor mop comprising a textile supporting structure having a top and an underside or bottom, and circumferential edges, with holder insert pockets sewn on the longitudinal ends of said top thereof, and with first and second material applied on said underside or bottom to take up soil and liquid, the first material including tassels of fine fibers thereof arranged circumferentially on the edges of said support structure, the second material having a high liquid uptake capacity, and being formed into several strips arranged in lamellar fashion juxtaposed to one another and forming U-shaped channels, wherein the strips are respectively fastened in sectors to the underside interior portions of said supporting structure, with said U-shaped channels opening away from the bottom of said structure.

4,961,243

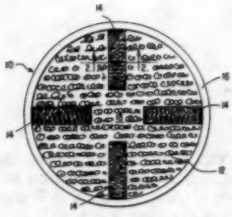
CARPET CLEANING PAD

John E. Barber, New Hope, Pa., assignor to Stockwell Group, Inc., Middleburg, Va.

Filed May 18, 1989, Ser. No. 354,127

Int. Cl.[5] A47L *11/14*

U.S. Cl. 15—230 **19 Claims**



1. A carpet cleaning pad for rotary floor cleaning machines, comprising:

a horizontal disc comprising a base material;

a primary layer comprising a blended yarn attached to said base material by tufting, said blended yarn including at least three different individual yarns wherein at least one of said individual yarns comprises fibers selected from the group consisting of acrylic fibers, wool fibers and polyester fibers; and

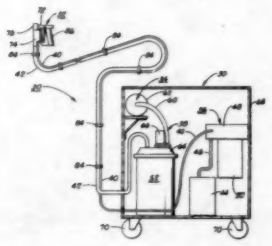
at least one radial portion of fibrous bristles attached to said base material, said fibrous bristles extending substantially vertically from said base material.

4,961,244

CLEANING ASSEMBLY FOR ELECTRICALLY CONDUCTING CLOSURES

Phillip W. Stanfield, and Phillip L. Stanfield, both of 229 S. Locust St., Osborne, Kans. 67473

Filed Jul. 11, 1988, Ser. No. 217,403
Int. Cl.[5] A47L *5/24*
U.S. Cl. 15—321 **4 Claims**



1. A cleaning assembly for cleaning and maintaining electrically conductive closure members wherein one of the closure members is provided with a tongue portion having edge sealing conductors and the other of the closure members defines a closure slot having edge sealing conductors disposed within the closure slot, the closure member defining the closure slot adapted to matingly receive the tongue portion of the other closure member, the cleaning assembly comprising:

spray gun having a nozzle and a hand operated trigger to selectively discharge a high velocity stream of solvent from the nozzle onto the surfaces of the edge sealing conductors in closure slot;

a support block supported by the spray gun, the support block having an elongated slot extending through one side thereof, and an internal cavity communicating with the elongated slot, the support block connectable to a vacuum source via the internal cavity such that solvent discharged from the nozzle is captured and recovered when the support block is positioned on the closure member defining the closure slot and the elongated slot in the support block is aligned with the closure slot.

4,961,245

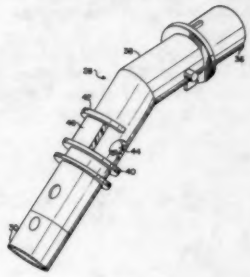
SUCTION CONTROLLING ARRANGEMENT IN A CANISTER VACUUM CLEANER

James F. Barnes, Jr., Anderson; Roy H. Herron, Jr., Starr, and Steven K. Hughes, Honea Path, all of S.C., assignors to Ryobi Motor Products Corp., Pickens, S.C.

Filed Feb. 5, 1990, Ser. No. 475,392
Int. Cl.[5] A47L *9/00*
U.S. Cl. 15—339 **2 Claims**

1. In a vacuum cleaner appliance having means for producing suction, a nozzle, and a conduit between said nozzle and said suction producing means, said conduit including a generally tubular hollow rigid handle section in line therewith, means for selectively controlling suction at said nozzle comprising:

means for providing fluid communication between said conduit and the ambient atmosphere, said fluid communication providing means including an aperture through said handle section, said aperture being shaped with an



inwardly converging wall on the side directed toward said nozzle; and

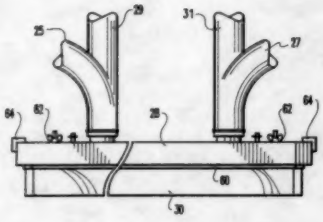
means for controlling the exposure of said aperture.

4,961,246

VACUUM CLEANING DEVICE

Ronald Hauge, and Carol Hauge, both of Rte. 8, Box 109, Mankato, Minn. 56001

Filed Mar. 29, 1989, Ser. No. 329,968
Int. Cl.[5] A47L *9/06*
U.S. Cl. 15—401 **1 Claim**



1. In a vacuuming device, the improvement comprising:

a generally rectangular squeegee carrier;

a pair of suction intake conduits communicating with respective intake apertures in said carrier;

a pair of parallel guide bars on an undersurface of said carrier;

a replaceable cartridge including wiping elements secured about a periphery of a mounting plate, said mounting plate dimensioned to be received between said guide bars; and

means for securing said cartridge to said carrier.

4,961,247

BALANCING ARRANGEMENT FOR DOUBLE HUNG WINDOWS

James A. Leitzel, Elizabethville, and Wesley H. Snyder, Halifax, both of Pa., assignors to Metal Industries, Inc., Elizabethville, Pa.

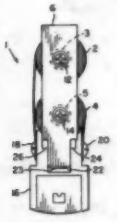
Filed Dec. 7, 1989, Ser. No. 447,533
Int. Cl.[5] E05F *1/02*
U.S. Cl. 16—197 **6 Claims**

1. A balancing arrangement for a double hung window, including means for preventing displacement of a closed upper window sash downwardly when an opened lower window sash is displaced downwardly against a sealing force at the horizontal center of the window, comprising:

first spring means secured to a jamb on one side of the upper sash and second spring means secured to a jamb on the other side of the upper sash;

first balance shoe means secured to the one side of the upper sash and second balance shoe means secured to the other side of the upper sash;

each of the first and second spring means including a spring arrangement secured to a corresponding one of the first and second balance shoe means, and including means for supporting the spring arrangement;



each of the first and second balance shoe means having a detent; and

each of the means for supporting the spring arrangement adapted for engaging a corresponding detent when the upper window sash is closed and the spring arrangement is unextended, whereupon the closed upper sash is prevented from being displaced downwardly when the lower sash is displaced downwardly against the sealing force at the horizontal center.

4,961,248

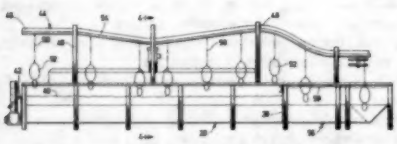
SCALDER APPARATUS

Frank J. Criscione, II, Kansas City, Mo.; James A. Bonuchi, Overland Park, Kans., and David R. Crawford, Blue Springs, Mo., assignors to Johnson Food Equipment, Inc., Kansas City, Kans.

Filed Jan. 19, 1990, Ser. No. 467,730

Int. Cl.[5] A27C *21/04*

U.S. Cl. 17—11.2 **16 Claims**



1. A poultry scalding apparatus comprising:

an elongated tank having a pair of side walls, end walls and a bottom wall, and defining a poultry travel path extending generally in the longitudinal direction of the tank, the tank being adapted to hold fluid therein;

means for maintaining a fluidline in the tank at a first predetermined height above the bottom wall;

cascading means for cascading fluid into the tank and onto the travel path from a second predetermined height above the fluidline along a preset length of the travel path; and

conveying means for conveying poultry along the travel path with the poultry supported substantially completely beneath the second predetermined height and completely above the fluidline in the tank so that the poultry exposed to by the cascading fluid while being maintained completely above the fluidline in the tank.

4,961,249

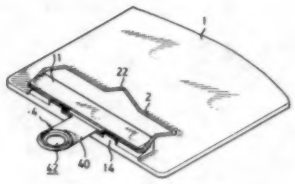
CLIPBOARD STRUCTURE

David Liu, and Jane Keo, both of No. 95, Kung Cheng Rd., Taichung, Taiwan

Filed Jan. 18, 1990, Ser. No. 466,932

Int. Cl.[5] B42F *1/00*

U.S. Cl. 24—67.3 **2 Claims**



1. A clipboard structure comprising a board with a seat formed on one end of an upper surface thereof, a recess being formed in an outer end of said seat and extending through said seat, a downwardly extending rib being laterally formed in an upper surface of a wall defining said recess, and at least one upwardly extending lug formed on an opening of said recess; a clamping element being substantially C-shaped with two legs thereof disposed in said recess; a spring element being substantially U-shaped with two free ends thereof respectively fixed to said legs of said clamping element, said spring element being disposed in said recess of said seat, a front end of said spring element contacting an inner end of said recess and being engaged with a rear end of said rib; said spring element biasing said legs of said clamping element so that a front end of said clamping element is forced to abut against said board; and said lug limiting a rearward movement of said legs of said clamping element.

4,961,250

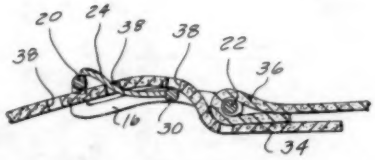
WATCH BAND BUCKLE

Anthony M. Calavenna, 2804 Rhineberry, Rochester Hills, Mich. 48309

Filed Sep. 22, 1989, Ser. No. 410,838

Int. Cl.[5] A44B *1/04*

U.S. Cl. 24—178 **2 Claims**



2. A buckle watch band comprising:

a flexible band having first and second ends;

a plurality of co-axially spaced apertures formed in the band extending from the first end; and

a buckle, the buckle comprising:

a frame having first and second opposed side bars and first and second spaced end bars;

the first end bar being fixedly joined to one end of the first and second side bars;

the second end bar being releasably joined to the other end of the first and second side bars;

the second end of the band being connected to the second end bar of the frame;

an intermediate bar disposed between and fixedly joined to the first and second side bars, the intermediate bar

being spaced from the second end bar of the frame to form an opening between itself and the second end bar of the frame for receiving the first end of the band underneath the second end of the band;

a tongue pivotally mounted on the intermediate bar, the tongue being releasably engageable with one of the apertures in the band; and wherein

a rigid structure for the frame is formed solely by the fixedly joined first end bar, the intermediate bar and the first and second side bars.

4,961,251

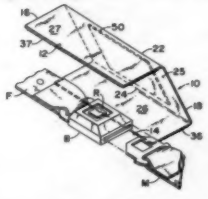
FLEXIBLE SAFETY BELT BUCKLE GUARD

Ann Smith, R.D. #2, Box 11-D, Monongahela, Pa. 15063

Filed Apr. 13, 1989, Ser. No. 337,269

Int. Cl.[5] A44B *11/25*

U.S. Cl. 24—633 **17 Claims**



1. A one piece safety belt buckle guard for preventing yound children from unfastening an engaged safety belt buckle assembly, said buckle guard comprising:

a flexible body adapted to be wrapped around the buckle assembly after each engagement of the same;

a rigid member adapted to prevent depression of a buckle assembly release mechanism through or beneath said rigid member;

means for positioning the rigid member adjacent the flexible body;

means for repeatedly connecting the flexible body to itself after being wrapped around the engaged belt buckle assembly; and

second means for connecting the flexible body around the belt buckle assembly.

4,961,252

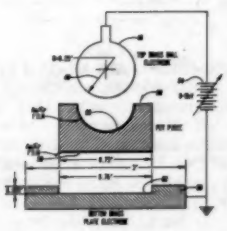
MEANS AND METHOD FOR NONUNIFORM POLING OF PIEZOELECTRIC TRANSDUCERS

David K. Hsu; Frank J. Margetan; Michael D. Hasselbusch; Samuel J. Wormley; Michael S. Hughes, and Donald O. Thompson, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Dec. 8, 1989, Ser. No. 447,831

Int. Cl.[5] H01L *41/22*

U.S. Cl. 29—25.35 **33 Claims**



1. A method for nonuniform poling of a piezoelectric transducer comprising:

altering a flat first surface of a piezoelectric material to produce at least one indentation;

cutting the piezoelectric material to present a opposite second surface generally parallel with the first surface;

bonding a highly electrically conductive material to at least portions of the first and second surfaces;

mateably inserting an electrode into each indentation;

abutting an electrode of opposing polarity on the second surface opposite the first electrode;

applying high voltage direct current electrical power through the electrodes and piezoelectric material for a predetermined duration;

cutting the piezoelectric material to remove any indentations and to prepare a generally planar two-sided disk; and

installing the disk within a transducer probe.

4,961,253

MANUFACTURING METHOD FOR CANTED-COIL SPRING WITH TURN ANGLE AND SEAL

Peter J. Balsells, P.O. Box 15092, Santa Ana, Calif. 92705, assignor to Peter J. Balsells and Joan C. Balsells, both of Santa Ana, Calif.

Division of Ser. No. 186,017, Apr. 25, 1988, Pat. No. 4,830,344. This application Dec. 13, 1988, Ser. No. 283,912

Int. Cl.[5] B21F *35/00*

U.S. Cl. 29—173 **9 Claims**

1. A method for making a garter-type axially resilient coiled spring comprising the steps of:

fabricating a wire to produce coils canted with respect to a centerline of the garter-type axially resilient coiled spring, each coil having a leading portion and trailing portion, said leading portion being disposed at a front angle to a line normal to a centerline of the garter-type axially resilient coiled spring and said trailing portion being disposed at a back angle to the normal line;

during fabricating of the wire, adjusting the magnitude of the back angle in order to achieve preselected load-deflection characteristics of the garter-type axially resilient coiled spring; and

attaching two ends of the wound wire in a manner forming a garter-type axially resilient coiled spring with an orientation defined by a turn angle in order to achieve selected load-deflection characteristics of the garter-type axially resilient coiled spring, said turn angle being greater than zero degrees and less than 90 degrees.

4,961,254

PROCESS FOR MANUFACTURING A TORSIONAL VIBRATION DAMPING DEVICE

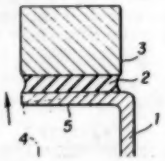
Rainer H. Andra, Limburg, and Günter Ullrich, Hemsbach, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/Bergstr, Fed. Rep. of Germany

Filed Jul. 6, 1989, Ser. No. 376,353

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1988, 3825063

Int. Cl.[5] B23P *13/00*

U.S. Cl. 29—173 **7 Claims**



1. Method for the production of a torsional vibration damper comprising a hub ring with an axial portion and an annular ring extending radially therefrom, an inertial ring located concentrically about said axial portion, and a continuously vulcanized rubber intermediate layer between said hub ring and said inertial ring, characterized in that subsequent to vulcanization the axial portion of the hub ring is expanded, said axial portion being expanded more toward said annular ring than it is away from said annular ring, thereby relieving contraction tension formed in the rubber layer during vulcanization.

4,961,255

APPARATUS FOR APPLYING AN INSULATING SLEEVE TO AN ELECTRIC CABLE JOINT

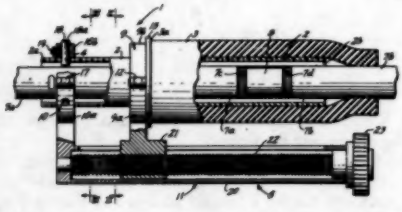
Ubaldo Vallauri, Monza, and Francesco Portas, Quattordio, both of Italy, assignors to Societa' Cavi Pirelli S.p.A., Milan, Italy

Filed Nov. 8, 1989, Ser. No. 433,979

Claims priority, application Italy, Nov. 10, 1988, 22578 A/88

Int. Cl.[5] B32B *1/08*

U.S. Cl. 29—235 **17 Claims**



1. Apparatus for applying an elastic sleeve around a joint between a pair of electric cables of predetermined outer diameters, said apparatus comprising:

a cylindrical tubular support for receiving on its outer surface a sleeve of elastomeric material in its elastically expanded condition, said tubular support having an inner bore of a diameter greater than the outer diameters of the cables to be joined; and

removing means for engaging the sleeve and the tubular support for removing the support from within the sleeve after said support and said sleeve have been positioned around the joint zone of the cables, said removing means comprising:

a first mobile element encircling said support for applying an axially directed force to an end of the sleeve;

a second mobile element encircling said support adjacent said first mobile element and having means engaging said tubular support and disposed to engage the outer surface of the insulation of one of said cables for maintaining said support substantially coaxial to the outer surface of the insulation of the cable; and

a driving unit acting between said first mobile element and said second mobile element, for moving one said mobile element away from the other thereof and thereby remove said tubular support from within the sleeve.

4,961,256

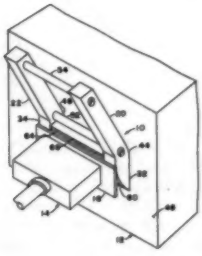
EXTRACTION TOOL

Nicholas J. Faillace, Lutherville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 5, 1989, Ser. No. 417,628

Int. Cl.[5] H05K *13/04*

U.S. Cl. 29—764 **7 Claims**



1. An extraction tool to be inserted between a device and an object held by the device for extracting the object from the device, the tool comprising:

a pair of interconnected spaced apart generally parallel lever arms having first ends for imparting an extracting force to the object;

spaced-apart generally parallel object-contacting arms obtusely extending from first ends adjacent the first ends of the lever arms to distal ends, the distal ends having convexly contoured portions for contacting an object to be extracted from a device;

pivots, defined by a curve on said parallel lever arms, adjacent the first ends of the lever arms and the first ends of the object-contacting arms, the pivots and the convexly contoured portions of the distal ends of the object-contacting arms being one piece, for contacting the device holding the object while the distal ends of the object-contacting arms are in contact with the object; and

a cross member extending along a line between the lever arms adjacent the pivots for maintaining the object-contacting arms in stable parallel spaced apart relationship.

4,961,257

DOOR ASSEMBLING APPARATUS FOR USE IN AUTOMOBILE ASSEMBLY

Shunji Sakamoto, Hiroshima; Junichi Usui, and Haruo Oda, both of Osaka, all of Japan, assignors to Mazda Motor Corporation and Daifuku Company, Ltd., both of, Japan

Filed Dec. 12, 1989, Ser. No. 449,706

Claims priority, application Japan, Feb. 2, 1989, 1-25201; Feb. 3, 1989, 1-26281

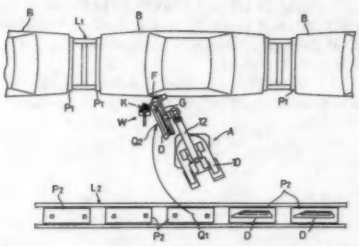
Int. Cl.[5] B23P *19/04*

U.S. Cl. 29—823 **5 Claims**

1. A door assembling apparatus for use in automobile assembly, comprising:

door transport means for conveying a door and for maintain-

ing a hinge member of a vehicle body and a corresponding hinge member of a door loosely engaged with each other; hinge-pin attaching means for inserting a gib-headed hinge pin through the engaged hinge members; and



a stopper for receiving a leading end of said hinge pin as being projected from and through the engaged hinge members;

said leading end of the hinge pin increasing in diameter through plastic deformation thereof by contact with said stopper.

4,961,258

DECORATIVE COLUMN FOR HOUSING REQUIREMENTS AND SIMILAR PURPOSES AND A METHOD OF MANUFACTURING SUCH A COLUMN

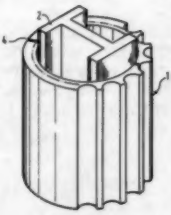
Dietrich Menzel, Siegsdorf, Fed. Rep. of Germany, assignor to Menzel-Leuchten GmbH & Co. KG, Fed. Rep. of Germany

Filed Apr. 14, 1989, Ser. No. 338,082

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1988, 3812426

Int. Cl.[5] E04C *3/36*

U.S. Cl. 52—747 **2 Claims**



1. A method for manufacturing a hollow column used to wainscot a support in a building defining a column axis, comprising the steps of:

cutting out of flat wooden boards, laminate plates or plates made of synthetic material annular stacking elements, stacking and gluing said elements about a stacking axis, to form a hollow column, cutting said hollow column into two half-columns along a plane including the stacking axis and re-assembling said half-columns around the support and gluing said half-columns together along a plane which includes the stacking axis.

4,961,259

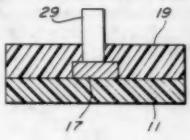
METHOD OF FORMING AN INTERCONNECTION BY AN EXCIMER LASER

Christopher M. Schreiber, Rancho Santa Margarita, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 16, 1989, Ser. No. 367,278

Int. Cl.[5] H05K *3/02*

U.S. Cl. 29—852 **8 Claims**



1. A method of forming an interconnection feature comprising the steps of:

forming a conductive layer on a substrate;

forming a conductor pad from said conductive layer;

forming a dielectric insulator film over said pad;

forming a masking layer on said dielectric insulator film;

ablating said masking layer and dielectric insulator film to form a via, said via leading to said pad;

inserting conductive material in said via, said conductive material filling at least a portion of the via above the dielectric insulator film; and

removing said mask layer to form said feature.

4,961,260

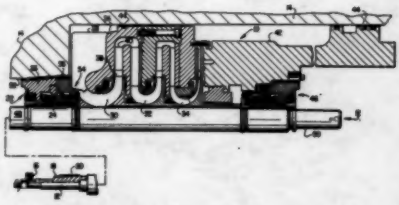
COMPRESSOR CARTRIDGE SEAL AND INSERTION METHOD

James Ferri, Northampton, Pa., and Norman A. Samurin, Allegany, N.Y., assignors to Dresser-Rand Company, Corning, N.Y.

Filed Feb. 13, 1989, Ser. No. 310,242

Int. Cl.[5] B23P *15/02*; F16J *9/00*

U.S. Cl. 29—888.025 **8 Claims**



1. A method for assembling a compressor, comprising the steps of:

fixing a fluid seal assembly to a bundle shaft;

assembling compressor bundle parts together, including a stationary vane assembly, to said shaft;

engaging said stationary vanes with a portion of said seal assembly;

inserting said bundle shaft, said seal assembly and other bundle elements into a compressor housing; and

pushing said bundle elements so that said stationary vane assembly forces said seal assembly into an opening in said housing.

4,961,261

ROLL FOR MILL AND METHOD OF MAKING A ROLL FOR A MILL

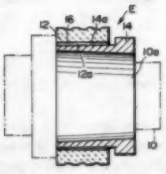
Tatsuo Kojima, Gifu; Tatsunori Kobayashi, Gifu; Kouki Katou, Gifu; Tetsuya Ohba, Muroran; Takashi Yatsuzuka, Muroran, and Koji Tanabe, Muroran, all of Japan, assignors to Nippon Steel Corporation and Mitsubishi Kinzoku Kabushiki Kaisha, both of, Japan

Continuation of Ser. No. 204,082, Jun. 8, 1988, abandoned. This application Aug. 14, 1989, Ser. No. 393,828

Claims priority, application Japan, Jun. 27, 1987, 62-98739[U]

Int. Cl.[5] B21D *53/00*

U.S. Cl. 29—895.21 10 Claims



9. A method of assembling a roll for a mill of the type including a roll shaft of a circular cross section, a ring of a wear-resistant material adapted to engage with a metal material to be rolled, and a tubular sleeve, the method comprising the steps of:

(a) positioning the ring around the sleeve;

(b) applying an adhesive between the ring and the sleeve;

(c) curing the adhesive to adhesively secure the ring and the sleeve together;

(d) after steps (a), (b) and (c), fitting the sleeve on the roll shaft in a secure pressure engagement therewith; and

(e) as the sleeve is being fit onto the roll shaft, compressing the cured adhesive between the ring and the sleeve to force the adhesive into frictional engagement with both the ring and the sleeve.

4,961,262

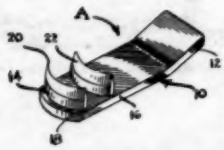
EYEBROW SHAVING APPARATUS

Virginia M. Lawrence, 934 S. Larch Ave., Inglewood, Calif. 90301

Filed Jun. 5, 1989, Ser. No. 361,497

Int. Cl.[5] B26B *21/00, 19/00, 19/44*

U.S. Cl. 30—32 17 Claims



1. An eyebrow shaving apparatus for trimming or shaving an eyebrow, said apparatus being comprised of:

a) a blade supporting plate having a pair of longitudinally extending sides and transverse ends,

b) a trimming and shaving blade mounted on said plate and extending transversely across said plate and projecting outwardly therefrom, said blade having an permanently fixed arcuate shape between its longitudinally extending sides with an outer razor sharp edge, and

c) a handle extending outwardly from said blade supporting plate in angular relationship to the plane of the blade supporting plate so that a user may grasp the handle trim his or her eyebrows without substantially blocking the line of sight of the user.

4,961,263

GUIDE BAR OF SOLID MATERIAL FOR THE SAW CHAIN OF A MOTOR CHAIN SAW

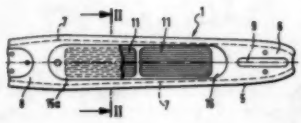
Norbert Apfel, and Hans P. Stehle, both of Waiblingen, Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Dec. 11, 1989, Ser. No. 448,625

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1988, 3842975

Int. Cl.[5] B23D *57/02*

U.S. Cl. 30—387 24 Claims



1. A guide bar for guiding the saw chain of a chain saw comprising:

a main member made of solid material and having two flat sides and an outer peripheral edge defining a guide groove for guiding the saw chain in its movement around the guide bar;

said main member defining a longitudinal center axis and having a clear-through opening formed therein for reducing the weight of the guide bar;

a fill body seated in said opening with an approximately precise fit;

two cover plates for covering said opening on respective ones of said flat sides;

said fill body defining a plurality of ribs extending across said opening;

said ribs conjointly defining two sets of component surfaces facing respective ones of said cover plates; and,

force-transmitting connecting means for connecting said fill body to one of said cover plates at one of said sets of component surfaces so as to permit forces to be transmitted therebetween and to the other one of said cover plates at the other one of said sets of component surfaces so as to also permit forces to be transmitted therebetween.

4,961,264

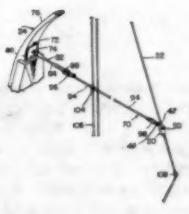
RESTRAINT ALIGNMENT ASSEMBLY FOR USE WITH A STRING-MOUNTED PEEPSIGHT

Kenneth D. Topel, 11220 164th St. E., Puyallup, Wash. 98374

Filed Feb. 21, 1989, Ser. No. 313,381

Int. Cl.[5] F41G *1/467, 11/00*

U.S. Cl. 33—265 8 Claims



1. In a compound bow having a handle portion and upper and lower limbs extending in opposite directions from the handle portion, said upper and lower limbs linked by a cable,

and said bow further including a bowstring extending between said upper and lower limbs and having a peepsight mounted in said bowstring, an improved alignment assembly for preventing twist of said peepsight, including:

an elastic member;

first means for attaching a first end of said elastic member to said upper limb;

a nonelastic member;

second means for attaching a first end of said nonelastic member to said peepsight;

third means for joining a second end of said elastic member to a second end of said nonelastic member; and

a clip slidingly engaging said cable and slidingly receiving said nonelastic member.

4,961,265

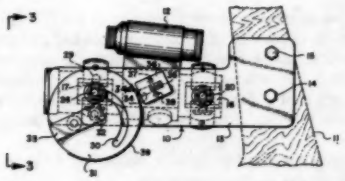
SIGHT MOUNTING DEVICE FOR ARCHERY BOWS

Kent S. Roberts, American Fork, Utah, assignor to Roberts Mfg., Inc., American Fork, Utah

Filed Apr. 3, 1989, Ser. No. 332,878

Int. Cl.[5] F41G *1/467*

U.S. Cl. 33—265 **27 Claims**



1. A mounting device for attaching a sight in operative position on an archery bow, comprising bracket means adapted to be fastened to the bow; a first sight mounting member; attachment means pivotally attaching said first sight mounting member to said bracket means; a second sight mounting member; attachment means movably attaching said second sight mounting member to said bracket means, and comprising an arcuate slot formed in said bracket means and a post member extending through said slot and engaging said second sight mounting member; and means comprising a cam member for moving said second sight mounting member in an arcuate path about said first sight mounting member attachment means.

4,961,266

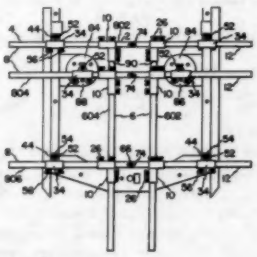
AUTO BODY REPAIR GAUGE ASSEMBLY

Thomas S. Papesh, 1915 N. Broadway, Crest Hill, Ill. 60435

Filed May 4, 1989, Ser. No. 347,130

Int. Cl.[5] G01B *5/14, 5/25*

U.S. Cl. 33—288 **15 Claims**



1. An auto body repair gauge comprising an alignment assembly having a lateral dimension at least as great as that of the portion of a vehicle on which it is to be used and a longitudinal dimension corresponding to the longitudinal dimension of the portion of a vehicle on which it is to be used, reference establishment means to place said alignment assembly in alignment with the longitudinal axis of a said vehicle on which it is to be used, and a plurality of location members of said alignment assembly movable laterally and longitudinally thereon relative to said longitudinal axis to locate the correct position of a plurality of portions of a said vehicle on which it is to be used and to hold such correct position for all of said plurality of portions of a said vehicle so located while a one of such portions out of its correct position is moved back into its correct position, wherein said alignment assembly includes a plurality of laterally extending members, each having an elongated dimension corresponding to the said lateral dimension of said alignment assembly and at least one longitudinally extending member having an elongated dimension corresponding to the said longitudinal dimension of said alignment assembly, wherein said longitudinally extending member extends parallel to a vertical plane through said longitudinal axis of a said vehicle on which said alignment assembly is to be used when said reference establishment means thereof has placed said alignment assembly in alignment with said longitudinal axis and in the same longitudinal direction as said longitudinal axis of said vehicle extends, said longitudinally extending member including an upwardly facing surface and a downwardly facing surface when in place on a said vehicle, said downwardly facing surface being in facing relationship with said vehicle throughout its entire extent when in place on said vehicle, a portion thereof being then in contact with a corresponding facing portion of said vehicle and directly supported thereby.

4,961,267

METHOD AND APPARATUS FOR MAKING COORDINATE MEASUREMENTS

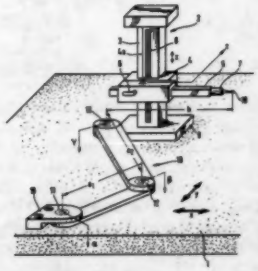
Klaus Herzog, Oberkochen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 450, May 20, 1988. This application Nov. 23, 1988, Ser. No. 276,471

Claims priority, application Fed. Rep. of Germany, May 23, 1987, 3717459

Int. Cl.[5] G01B *5/20*

U.S. Cl. 33—503 **28 Claims**



1. A coordinate measuring apparatus comprising:

surface means for defining a planar surface;

a measuring device mounted on said surface so as to be movable thereon, the measuring device including: a carrier having a base in contact engagement with said surface; said carrier defining a guide path extending vertically upwardly from said base; a measuring head mounted on said carrier so as to be displaceable along said guide path; said measuring head including a measuring probe responsive to contact in a plurality of spatial directions; and, position sensing means for measuring the vertical position of said measuring head along said guide path;

linkage means for connecting said measuring device to a fixed reference location on said planar surface;

a plurality of sensing units mounted on said linkage means for measuring the position of said measuring device in said plane;

said linkage means including: a guide; a first rotational joint for pivotally mounting said guide at said reference location; a pull-out arm slideably engaging said guide and having an outer end; and, a second rotational joint pivotally connecting said outer end to said measuring device;

one of said sensing units being a linear transducer for measuring the pull-out length of said pull-out arm with respect to said guide;

one of the remaining ones of said sensing units being a first angle encoder corresponding to said first rotational joint for measuring the angular position of said arm vis-a-vis said reference location; and,

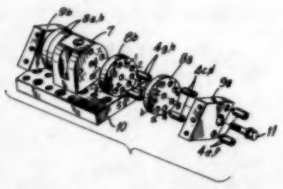
an other one of the remaining ones of said sensing units being a second angle encoder corresponding to said second rotational joint for measuring the angular position of said arm vis-a-vis said measuring device.

4,961,268

MODULAR METHOD AND SYSTEM FOR SETTING FIXED-ANGLES OF MODULAR TOOLS

Changxiang Xu; Oialin Yu, and Ruixing Zhuo, all of Gui-Zhou, China, assignors to Qing-Yang Machine Works, Gui-Zhou and China National Aerotechnology Import and Export Corp., Beijing, both of, China

Filed Feb. 23, 1989, Ser. No. 315,409
Claims priority, application China, Feb. 29, 1988, 88100600.9
Int. Cl.[5] B23Q *3/04*
U.S. Cl. 33—568 **4 Claims**



1. A modular method for setting fixed angles of modular tools, comprising the steps of providing a plurality of fixed angle setting disks, providing a plurality of dowel pins and bolts, forming predetermined-angle triads of interlocking holes of a modular tooling system in said disks, defining dowelling formulas for said disks from a table or CAD library, and setting up any fixed angles of modular tools by turning said triads of holes around a symmetrical central axis thereof relative to coordinate axes of a plate, said axes including with one another an angle of 90° in a fine angular increment, and by coaxially dowelling said disks on said plate, in accordance with said dowelling formulas.

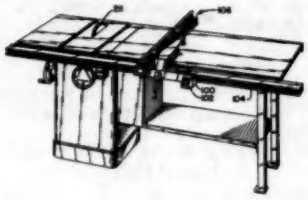
3. A modular system for setting fixed angles of modular tools, comprising a plurality of fixed-angle setting disks each formed with a plurality of triads of interlocking holes of a modular tooling system, which include therebetween premanufactured, predetermined angles, each of said triad of holes having two holes which are aligned with one another symmetrically relative to one through hole, and a plurality of dowel pins for aligning interlocking holes of different disks, all through holes in said disks being aligned with each other and being each a central hole of each of said disks.

4,961,269

BI-DIRECTIONAL DIRECT READ MEASUREMENT SYSTEM

David J. Luttmer, Glenshaw; Thomas L. Panian, Allison Park; Barry D. Wixey, and Raymond L. Wilson, both of Pittsburgh, all of Pa., assignors to Delta International Machinery Corporation, Pittsburgh, Pa.

Filed Aug. 19, 1988, Ser. No. 233,499
Int. Cl.[5] G01B *7/04, 11/04*
U.S. Cl. 33—706 **23 Claims**



1. A measurement system for providing a direct reading of a position on either side of a reference position, comprising:

(a) reader head means comprising a reader element configured to move laterally with respect to a calibrated reference member for making an electronically derived measurement relative to either side of said reference position; and

(b) display means for digitally displaying the measurement, the display means comprising:

(i) first mode display means for increasing the measurement as the reader element moves away from a first side of the reference position and for decreasing the measurement as the reader element moves toward the first side of the reference position; and

(ii) second mode display means for increasing the measurement as the reader element moves away from the other side of the reference position and for decreasing the measurement as the reader element moves toward the other side of the reference position; said device including means for switching between said modes as desired and updating the display upon such a selection.

4,961,270

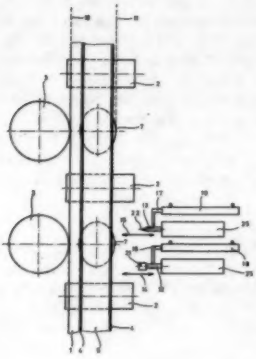
APPARATUS FOR DETERMINING THE SPACING BETWEEN GLASS SHEETS OF INSULATING GLASS PANES

Peter Lisec, Bahnhofstrasse 34, A-3363 Amstetten-Hausmening, Austria

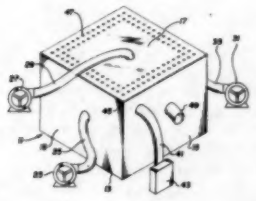
Filed Dec. 12, 1988, Ser. No. 283,557
Claims priority, application Austria, Apr. 25, 1988, 1050/88
Int. Cl.[5] C03B *33/04*
U.S. Cl. 33—833 **5 Claims**

1. Apparatus for determining the distance between mutually facing inner surfaces of a pair of parallel glass sheets of an insulating glass element having a spacer frame between the sheets, comprising a tracer pin advanceable into contact with a side surface of a said glass sheet having a said spacer frame on said surface, said first tracer pin moving perpendicularly to said surface, a second tracer pin spaced from said first tracer pin and movable parallel to the direction of movement of said first tracer pin into contact with said spacer frame prior to the application of a second said glass sheet against said spacer

frame, and means for detecting the difference in the distance of advance of said first and second tracer pins into contact respectively with said sheet and said frame, thereby to determine the thickness of said frame.



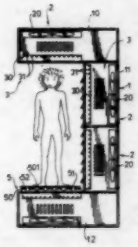
4,961,271
APPARATUS FOR TREATING FURNITURE
Christopher S. Butler, 2750 Northaven #207, Dallas, Tex. 75229
Filed Mar. 27, 1989, Ser. No. 328,686
Int. Cl.[5] F26B *19/00*
U.S. Cl. 34—60 **12 Claims**



1. An apparatus for treating damaged furniture, comprising:
a floor;
a plurality of sides extending upward from the floor to form a chamber for containing the furniture to be treated;
a top;
attachment means for attaching the top to the sides;
inflation means for forcing a gas into the chamber to raise the top and the sides off the floor, the inflation means including a dehumidifier to reduce the humidity of the gas; and
exit means for allowing the gas to escape from the chamber at a selected rate.

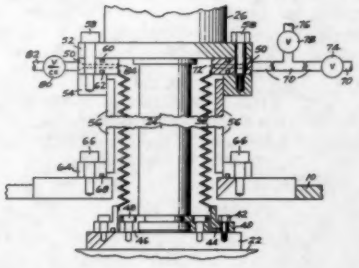
4,961,272
DRYING APPARATUS
Shih-Ye Lee, No. 19-2, Sen-Wei St., Hsueh-Chia Chen, Tainan Hsien, Taiwan
Filed Dec. 12, 1989, Ser. No. 450,833
Int. Cl.[5] F26B *19/00*
U.S. Cl. 34—90 **5 Claims**

1. A body drying apparatus comprising:
a vertical housing, having a generally horizontal base portion with a top wall, a generally vertical intermediate portion with an inward wall, and a generally horizontal top portion with a bottom wall, said top wall of said base portion and said bottom wall of said top portion and said inward wall of said intermediate portion together defining a drying space in which a user can stand on said base portion;
a fan device including three fans respectively installed in said top portion, said intermediate portion and said base portion of said housing, said fans blowing air to said drying space;



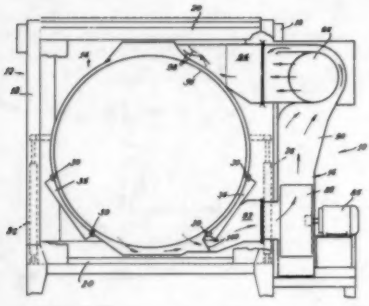
a heating device including three heating elements which are respectively interposed between said fans and said drying space, so as to heat air which is transmitted from said fans to said drying space; and
a control switch unit selectively supplying electric power to some or all of said fans and said heating elements so as to dry hair and/or an upper part and/or a lower part of said body of said user.

4,961,273
METHOD AND MEANS FOR ASSURING FREEZE DRYER CHAMBER STERILITY
John M. Fay, Warminster, Pa., assignor to Hull Corporation, Hatboro, Pa.
Continuation-in-part of Ser. No. 31/638, Mar. 30, 1987, abandoned. This application May 6, 1988, Ser. No. 190,711
Int. Cl.[5] F26B *19/00*
U.S. Cl. 34—92 **7 Claims**



1. In a freeze dryer in which an external elongated hydraulic cylinder has an elongated piston rod extending therefrom through a wall of the freeze dryer for longitudinal reciprocation within a freeze dryer chamber for moving a plurality of vertically separated shelves toward and away from each other, the method of preventing possible contamination of the freeze dryer chamber by the piston rod, comprising isolating the piston rod from the interior of the freeze dryer chamber by enclosing the piston rod within the freeze dryer chamber with an impervious sleeve capable of extending and retracting with the piston rod through the full range of movement of the shelves.

4,961,274
SEAL SYSTEM FOR DRYER
Randall R. Coffman, Palatine, Ill., assignor to Norman Dryer Company, Inc., Crystal Lake, Ill.
Filed Mar. 27, 1989, Ser. No. 329,395
Int. Cl.[5] F26B *11/02*
U.S. Cl. 34—133 16 Claims



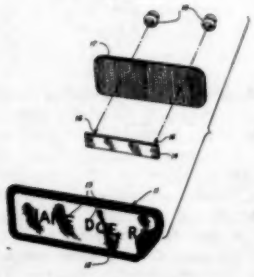
15. In a dryer for extracting moisture from wet goods, the dryer including a tumbler cylinder mounted for rotation about a horizontal axis and having generally planar ends, a shell in which the tumbler cylinder is housed and which generally surrounds the cylinder, and means for supplying heated air to the cylinder for drying goods therein and withdrawing air from the cylinder, the improvement comprising a seal for preventing leakage of air from the ends of the cylinder, the seal comprising

a. an end seal for each end of said cylinder; each end seal comprising an annular ring abutting each said end,

b. means secured to said shell for mounting each ring proximate a respective end of said cylinder, and

c. means for laterally shifting each said ring toward and away from said planar end, said means for shifting comprising a plurality of threaded rods secured to each said ring, each rod extending through an aperture in said shell and including a nut engaged on said rod, and including means for locking said nut at an axial location on said rod to secure said ring, said means for locking comprising a collar secured to said nut, said collar having a series of peripherial notches, and including a screw threadedly secured in said shell and engaging one of said notches.

4,961,275
IDENTIFICATION BADGE
Rita R.. Klein, 634 E. Cunningham Dr., Palatine, Ill. 60067
Filed Nov. 16, 1988, Ser. No. 272,230
Int. Cl.[5] A44C *3/00*
U.S. Cl. 40—1.5 3 Claims



1. An identification badge for sterile outerware comprising a separable fastener made up of a loop fabric layer and a hook fabric layer, attachable to each other on contact through multiple hook and loop engagement, one of said fabric layers being slightly smaller in length and width than the other, a rigid support member positioned between said loop fabric layer and said hook fabric layer and substantially smaller in length and width than either of them, a penetrating fastener integral with said rigid support member which passes through the smaller of said fabrics and has at least one pointed end for attachment through said sterile outerware, identification indicia on the outer surface of the larger of said fabric layers when said layers are engaged about said support member, said larger fabric layer being surrounded by an embroidered edge.

4,961,276
ORNAMENTAL CRYSTAL BALL
Ming H. Lin, No. 2, Lane 429, Fu Chin St., Taipei, Taiwan
Filed Jun. 14, 1988, Ser. No. 206,436
Int. Cl.[5] G09F *19/00*
U.S. Cl. 40—410 1 Claim

1. An ornamental crystal ball comprising a base, a ball filled with water and mounted on an upper plate of said base, a model mounted on said upper plate of said base, a plurality of suspensible objects disposed in said ball and a driving means for agitating the water and move the suspensible objects, wherein said driving means comprising:

a housing having an upright bar extending through said upper plate and engaging with said upper plate;

a first magnet disposed on said upright bar;

an impeller body disposed on said upright bar, said first magnet being received in and adhered to said impeller, both of said first magnet and said impeller being rotatable relative to said upright bar; and

a second magnet received in a carrier engaging with a spindle of a motor, said motor being received in said housing and connecting to a power supply.

4,961,277
QUICK RELEASE SAFETY DEVICE FOR HANDGUNS
Nathan Rosenbaum, 6401 SW. 82nd St., Miami, Fla. 33143
Filed Dec. 29, 1989, Ser. No. 459,334
Int. Cl.[5] F41A *17/74*
U.S. Cl. 42—70.11 13 Claims

1. A child-resistant safety device for attachment to firearms having a barrel with a muzzle and a cocking mechanism such as a hammer, for temporarily rendering the firearm inoperative, comprising:

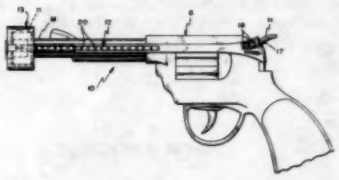
a block adapted to lie against the muzzle of the firearm;

a strap having a first portion adapted to extend behind the cocking mechanism of the firearm, and a second portion adapted to extend from the first portion to the block;

means for securing the strap to the block with the strap held firmly behind the hammer to prevent its operation and thus prevent operation of the firearm; and

releasable means secured on the block through interengaged

detent means to prevent removal of the block from the muzzle and thus prevent removal of the strap from the cocking mechanism, said releasable means being remov-



able from the block upon disengagement of the detent means, whereby the block and strap may be removed from the firearm to enable it to be fired.

4,961,278

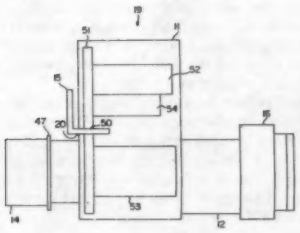
DAY/NIGHT TELESCOPIC SIGHT

Charles B. Johnson, Ft. Wayne, Ind., and Richard E. Blank, Roanoke, Va., assignors to ITT Corporation, New York, N.Y.

Continuation of Ser. No. 99,925, Sep. 23, 1987, abandoned. This application Mar. 17, 1989, Ser. No. 326,495

Int. Cl.[5] F41G *1/36, 1/38*

U.S. Cl. 42—101 **6 Claims**



1. A sight apparatus for use in conjunction with a firearm to enable a user to selectively implement a day or night operation, comprising:

a telescopic sight assembly adapted to be mounted on a hand-held weapon, said assembly extending in the same longitudinal direction as the weapon and including

a first section having an objective lens,

a second section spaced from said first section and extending along the longitudinal axis of said first section, said second section including an ocular lens, and

a housing mounted between said first and second sections, a portion of said housing extending outside of the longitudinal axis of said first and second sections;

a plate pivotally mounted in said housing and being movable in a plane which extends perpendicular to said longitudinal axis;

an optical assembly mounted on said plate, said assembly including

a microchannel plate image intensifier tube for night operation,

power supply means communicating with said image intensifier tube;

means for activating said power supply means;

optical means for day operation, said optical means including a fiber optic array; and

lever means coupled to said plate and extending outside of said portion of said housing for pivoting said plate between a first position in which said image intensifier tube is aligned with the longitudinal and optical axes of said telescopic sight assembly and said fiber optic array is located in said housing portion, and a second position in which said fiber optic array is aligned with the longitudinal and optical axis of said telescopic sight assembly and said image intensifier tube is located in said housing portion.

4,961,279

METHOD OF BATT MOUNTING

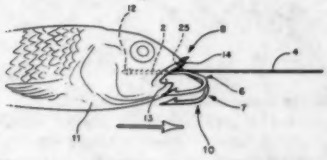
Harold C. Hanson, Box 479 Will St., Mahomet, Ill. 61853

Continuation of Ser. No. 928,972, Nov. 10, 1986, Pat. No. 4,848,024, which is a continuation of Ser. No. 855,121, Apr. 23, 1986. This application May 31, 1989, Ser. No. 359,204

The portion of the term of this patent subsequent to Jul. 18, 2006, has been disclaimed.

Int. Cl.[5] A01K *83/00*

U.S. Cl. 43—43.16 **8 Claims**



1. Method of mounting a fishing device having at least one game fish hook proximate its forward end and a line attaching means at its rearward end, to a bait, comprising the steps of:

inserting the rearward end portion of the fishing device including the line attaching means into said bait until a bait mounting means located proximate to the forward end portion of the fishing device is proximate to at least a portion of said bait, such that a flexible member attached to the line attaching means passes from the inside of the bait out through the point of insertion,

said insertion beginning with said rearward end;

maintaining said at least one game fish hook substantially outside of said bait; and

engaging said bait mounting means with said bait.

4,961,280

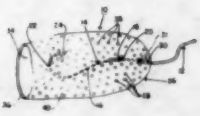
LIVE BAIT PROTECTOR AND HOOK APPARATUS

Donald Hudson, 6402 Darlinghurst, Houston, Tex. 77085

Filed Feb. 6, 1989, Ser. No. 306,476

Int. Cl.[5] A01K *97/04, 97/02*

U.S. Cl. 43—44.99 **20 Claims**



1. A live bait protector and hook apparatus for protecting bait while in the water including:

a fishing hook for engaging and holding bait on a lower portion thereof;

a fishing line coupled to an upper portion of the fishing hook;

transparent means slidably coupled to the line for surrounding the encasing the entire hook and for facilitating the transfer of odor from the bait into the water; and

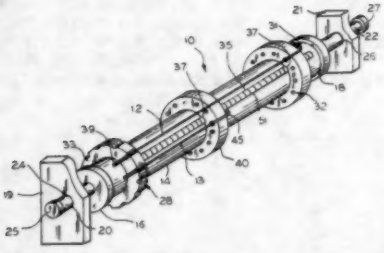
means for sealing the transparent means so that the bait and entire hook are sealed in the transparent means and protected from unwanted tampering.

4,961,281

FISHING LEADER HOLDER

Earl R. Listebarger, Jr., 6955 Holeman #11, Blaine, Wash. 98230

Filed Nov. 20, 1989, Ser. No. 438,787
Int. Cl.[5] A01K 97/00
U.S. Cl. 43—57.2 18 Claims



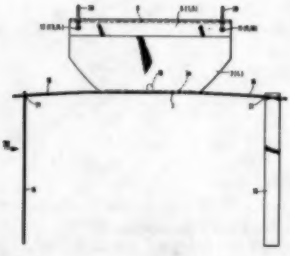
1. A fishing leader holder comprising:
an elongated tube including a graduated scale extending longitudinally along the length of said tube;
a first annular flange affixed to said tube proximate one end of said tube, said first annular flange including a plurality of spaced apart longitudinal grooves in its peripherial surface;
a second annular flange slidably mounted to said tube including means for releasably retaining said second annular flange at a plurality of selected positions along said tube spaced from said first annular flange, said second annular flange including a plurality of spaced apart longitudinal holes, each of said plurality of longitudinal holes being generally aligned with respective ones of said plurality of longitudinal grooves.

4,961,282

TRAP FOR FLYING INSECTS, ESPECIALLY MOTHS THAT ATTACK FOODSTUFFS

Thomas Hopye, Rheinfelden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 2, 1989, Ser. No. 389,154
Claims priority, application Switzerland, Aug. 10, 1988, 3017/88
Int. Cl.[5] A01M 1/14
U.S. Cl. 43—114 12 Claims



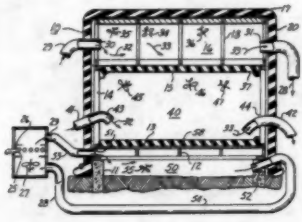
1. A trap for flying insects comprising a base with adhesive coating and a housing defining insect-entry openings and at least one opaque optical attractant suspended therefrom which is substantially vertical in the use position, has a length of at least 20 cm and a height to width ratio of greater than 4:1, and serves as an optical attractant for the insects.

4,961,283

EXTERMINATION OF INSECTS BY HEAT

Charles Forbes, 7343 Via Lorado, Rancho Palos Verdes, Calif. 90274

Continuation of Ser. No. 902,317, Aug. 29, 1986. This application Feb. 10, 1989, Ser. No. 309,319
The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.
Int. Cl.[5] A01M 1/20
U.S. Cl. 43—124 5 Claims



1. A method of killing space occupying insects which are in occupancy in hidden void spaces, which void spaces are formed by a plurality of structural elements, said elements having a void space facing surface, and at least one of said elements having a living space facing surface, and said elements having dimensions of thickness and length so as to form structure around said void spaces, said insects having the inherent characteristic of susceptibility to a lethal temperture which if maintained for a necessary period of time causes the death of said insects, said method comprising:
heating said hidden void space to said lethal temperature by the application of heated gas, and maintaining said lethal temperarure for said period of time by heating said living space facing surface and thereby heating its respective structural element to heat its respective void space facing surface, and thereby heating said hidden void space to exterminate the insects therein;
circulating said heated gas.

4,961,284

VERTICAL GARDEN

Bruce Williams, Post Office Address: Rte. 109A, Center Tuftonboro, N.H. 03816

Filed Sep. 9, 1988, Ser. No. 242,100
Int. Cl.[5] A01G 9/02
U.S. Cl. 47—66 3 Claims

1. A self-watering, vertical array, plant growing receptacle comprising:
a frame, constructed of rigid self-supporting material, said frame having substantially vertical faces including side and front faces, a top that is open, and a bottom that is closed; a liner, custom-shaped to closely fit the inside of the frame to form side and front walls, located in the frame, said liner being made from water resistant material, and having a top that is open and a bottom that is sealed, said liner being adapted to contain plant growing medium within the liner and occupying a substantial portion of the

volume within the liner, at least one of said faces defining a plurality of vertically arranged framing openings for access to said liner for puncturing said liner through said framing openings for presenting plant growth in a vertical plane in the medium by way of said framing openings, a plurality of tubes, each sealed at a first end, open at a second end for receiving water, and having a plurality of openings along their length for delivering water to said plant growing medium, said tubes being located in the plant growing medium and oriented generally vertically with the first end downward so that said openings at various depths correspond to certain of said framing openings, said openings in said generally vertically oriented tubes being smaller at the lower part of the tube than those toward the upper part of the tube to provide substantially the same water delivery at the lower hydrostatic pressure at the upper part of the tube as at their lower ends of greater hydrostatic pressure to plant growth presented in a vertical plane through said framing openings at several depths corresponding to said tube openings, said plurality of tubes being located equally distant from one another along a center line in said growth medium, the distances between each tube and between the end tubes and the inner surfaces of the side walls being selected to maintain wetting of all the growth medium so that remote growing medium receives root growth.

4,961,285

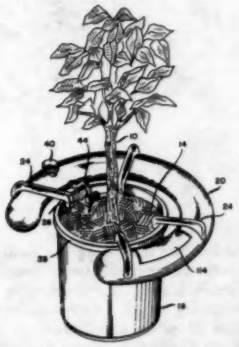
PLANT IRRIGATION SYSTEM

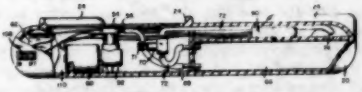
Wayne Jenkins, 12959 Pennypacker La., #9, and Richard Marz, 1068 Larch Way, both of West Palm Beach, Fla. 33414

Continuation-in-part of Ser. No. 870,849, Jun. 5, 1986, Pat. No. 4,805,342. This application Feb. 17, 1989, Ser. No. 312,607

Int. Cl.[5] A01G *27/00*

U.S. Cl. 47—79 **13 Claims**





1. A plant-watering apparatus for providing liquid to a plant at a substantially constant rate, comprising:

a housing;

means for attaching the housing to the side of a plant grow pot;

a closed liquid reservoir within said housing;

means for introducing liquid into said liquid reservoir;

gas pressurization means within said housing for generating a pressurized gas, and having gas outlet means;

gas accumulation tank means within said housing, said gas accumulation tank means having gas inlet means and gas outlet means, said gas inlet means of said gas accumulation tank means being in fluid communication with said gas outlet means of said gas pressurization means, said gas outlet means of said gas accumulation tank means being in fluid communication with said liquid reservoir; and,

discharge conduit means communicating with said liquid reservoir and extending outwardly and upwardly from said liquid reservoir, whereby said apparatus will deliver liquid under the pressure of said pressurized gas to a location above said liquid reservoir, and whereby said liquid can flow into said plant grow pot.

4,961,286

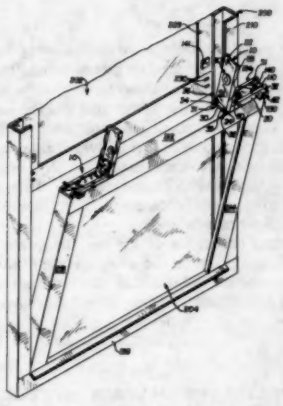
TOGGLE TILT LATCH FOR A TILTABLE WINDOW ASSEMBLY

William P. Bezubic, Indiana, Pa., assignor to Season-all Industries, Inc., Indiana, Pa.

Filed Jun. 14, 1989, Ser. No. 366,497

Int. Cl.[5] E05D *15/22*

U.S. Cl. 49—175 **54 Claims**



1. A window tilt latch, comprising:

base means for mounting said tilt latch on a window sash mounted in a window frame;

handle means pivotally mounted to said base means; and

plunger operatively associated with said handle means, said tilt latch being adapted so that said window sash is not tiltable relative to said window frame in which said window sash is mounted when said plunger is in a first position and said window sash is tiltable relative to said window frame when said plunger is in a second position, whereby ready visual observation of the position of said handle means will indicate whether said plunger is in said first or second position and whereby said handle means can be sued as hand holes by a user to facilitate tilting said window sash with respect to said window frame.

4,961,287

WOOD JOINTER AND PLANER BLADE SHARPENING HOLDER

Lawrence T. Compton, R.R. 1 Box 77, Nokomis, Ill. 62075

Filed Aug. 24, 1989, Ser. No. 399,889

Int. Cl.[5] B24B *7/00*

U.S. Cl. 51—74 BS **1 Claim**

1. A wood jointer and planar blade sharpening device consisting of:

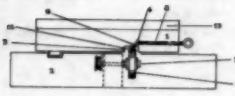
a table saw, the table saw having a planar work surface, an elongated slot in the work surface to permit a tool to

protrude through the slot, and an elongated groove spaced a distance from and parallel to the tool slot;

a tool consisting of a grinding wheel mounted in the table saw tool slot, the grinding wheel having an abrasive peripheral surface and a rotational axis, the grinding wheel positioned in the slot so that the rotational axis lies in a plane parallel to the work surface, the rotational axis perpendicular to the slot so that the peripheral surface of the grinding wheel extends a distance beyond the work surface; and

a blade holder, the blade holder comprising:

a hand-held block means, the block means consisting of a base, the base having an upper surface and a lower surface; means for gripping the block mounted on the upper surface; a first groove means for holding the blade in



proper position, the groove means being located on the lower surface, the groove means being formed with an angled slot to serve as a seat for the blade, second groove means located on the lower surface, the second groove means being coincident with the first groove means, the second groove means being wider than and shallower than the first groove means to allow the peripheral surface of the grinding wheel to contact the blade; and fastening means to securely fasten the blade in the angled slot of the first groove means, and

guide means on the lower surface, the guide means fitting into the guide slot on the work surface of the table saw to guide the block and therefore the blade across the peripheral surface of the grinding wheel, to sharpen the jointer blade.

4,961,288

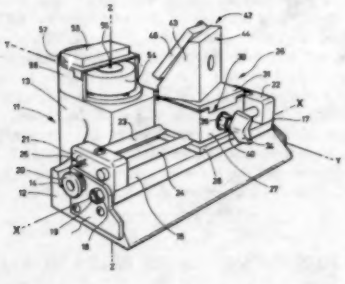
APPARATUS FOR SHARPENING EDGE TOOLS

Thomas Ketteringham, Mevagissey, England, assignor to Martek Limited, Great Britain

Filed Sep. 29, 1988, Ser. No. 250,843

Int. Cl.[5] B24B *3/36*

U.S. Cl. 51—92 BS **11 Claims**



1. Apparatus for sharpening an edge tool having a linear cutting edge, comprising:

a rotary grinding stone having a cylindrically curved surface,

means mounting said rotary grinding stone for rotation about an axis coincident with the axis of said cylindrically curved surface, and

tool mounting means including:

guide means for guiding relative movement between said edge tool to be sharpened and said rotary grinding stone, said guide means guiding said relative movement between said edge tool and said rotary grinding stone to lie in a displacement plane which is substantially perpendicular to the plane including the point of contact between said edge tool and said rotary grinding stone and the axis of rotation of said rotary grinding stone, a tool mount having a tool mount face and being turnable about an axis perpendicular to the plane of said tool mount face, and

a tool mount carrier turnable about an axis parallel to said axis of rotation of said rotary grindstone, said tool mount and said tool mount carrier being connected together so that angular displacement of said tool mount carrier about its axis is associated with related angular displacement of said tool mount about its axis with respect to said tool mount carrier in such a way that one edge of said tool mount always lies in a plane parallel to said displacement plane.

4,961,289

MACHINE TOOL FOR FINE MACHINING THE TOOTH FLANKS OF PRETOOTHED GEARWHEELS

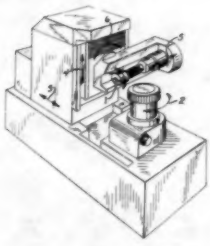
Gerd Sulzer, Wiggensbach, Fed. Rep. of Germany, assignor to Liebherr-Verzahntechnik GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 163,982, Mar. 4, 1988, abandoned. This application Sep. 20, 1989, Ser. No. 410,015

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1987, 3707664

Int. Cl.[5] B24B *19/00*

U.S. Cl. 51—105 GG **11 Claims**



1. A machine for fine machining the tooth flanks of pretoothed gearwheels, said machine comprising:

a carrier for receiving the gearwheel to be fine machined, said carrier having means for driving the gearwheel in a rotary manner about the axis thereof;

a tool comprising a spindle mounting a grinding worm and a polishing worm, said polishing worm being displaced from said grinding worm along the axis of said spindle;

a tool slide for receiving said tool and having means for rotating said tool about the axis of said spindle, said tool slide being movable radially and tangentially with respect to the gearwheel and axially along the gearwheel, said tool slide moving said tool radially into engagement with the gearwheel, said tool slide moving said tool tangentially of the gearwheel in a given direction for sequentially engaging said grinding worm and polishing worm in the gearwheel, said tool slide moving said tool with an axial component in one direction when said grinding worm engages the gearwheel while simultaneously moving said tool tangentially in said given direction, only said grinding worm engaging the gearwheel during movement tangentially in the given direction and with the axial component in the one direction, said tool slide moving the tool with an axial component in the other direction when said polishing worm engages the gearwheel while simultaneously

moving said tool tangentially in said given direction, only said polishing worm engaging the gearwheel during movement tangentially in the given direction and with the axial component in the other direction; and

means for synchronizing the rotation of the gearwheel and said tool for securing the engagement of the latter with the former.

4,961,290

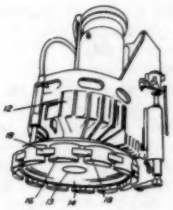
MOUNT FOR GRINDING WHEEL

John H. Hawkes, Gloucester, and John A. MacRae, Lexington, both of Mass., assignors to Blanchard Abrasives, Inc., Marysville, Wash.

Continuation-in-part of Ser. No. 457,679, Jan. 13, 1983, abandoned. This application Sep. 18, 1985, Ser. No. 777,217

Int. Cl.[5] B24D *7/06*

U.S. Cl. 51—209 R 4 Claims



1. In a rotary grinder having a plurality of non-interlocking abrasive segments each held adjacent one another in a chuck by clamps between adjacent segments to form a substantially circular grinding wheel, the improvement comprising a flexible plastic cap slidably received over one end of each of said segments, each of said caps being molded independently of said segments and having a depending peripheral portion providing a close sliding fit with the exterior surface of each of said segments adjacent said one end, and flap means integral with and depending from each of said peripheral portions and also having a close sliding fit with said exterior surface thereof, each of said clamps bearing upon the flap means of two adjacent segments and holding said segments in predetermined positions in said chuck, said exterior surface of said segments otherwise being left uncovered by said cap.

4,961,291

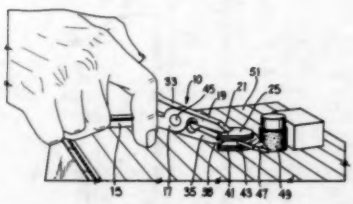
GLASS HOLDER TOOL

Richard L. Lagassee, 1625 W. Territorial Rd., Battle Creek, Mich. 49015

Filed Aug. 3, 1989, Ser. No. 389,127

Int. Cl.[5] B24B *41/06*

U.S. Cl. 51—217 P 14 Claims



1. An apparatus for holding flat sheet-like objects against an abrasive wheel which is rotatably supported with respect to a planar work surface, comprising:

first and second elongate lever arms, said lever arms respectively including first and second handle portions at one end thereof, first and second jaw portions at the other end thereof, and central portions extending respectively between said handle portions and said jaw portions, said lever arms being disposed in a crossing arrangement such that said central portions overlap, said lever arms being pivotally connected at said overlapped central portions, said handle portions being disposed on a first side of said overlapped central portions and said jaw portions being disposed on a second side of said overlapped central portions opposite said first side, said lever arms being pivotable such that said jaw portions move relatively toward and away from each other in response to relative movement of said handle portions respectively toward and away from each other, each said jaw portion having a free end spaced from said overlapped central portions; and

first and second gripping plates each fixedly and non-movably attached to respective said free ends of said first and second jaw portions, said first and second gripping plates including first and second gripping surfaces, at least one of said first gripping plate and said first jaw portion having means defining a substantially flat support surface facing oppositely from said first gripping surface and adapted for engagement against the planar work surface, said gripping plates surfaces face each other, said gripping plates being relatively movable toward and away from each other along with said jaw portions, said first gripping plate extending away from said first jaw portion at a first fixed angle relative thereto such that, when said gripping plates are separated by a first predetermined distance, said second handle portion is offset from said support surface toward said second gripping plate by a second predetermined distance, said second gripping plate extending away from said second jaw portion at a second fixed angle relative thereto such that said gripping plates are substantially parallel to each other when they are separated by said first predetermined distance.

4,961,292

BUILDING STRUCTURE WITH AN ELEVATOR

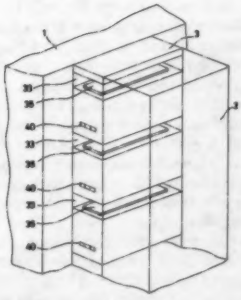
Shin Watanabe, c/o Shin Watanabe, 22-14, Ryoke 7-chome, Urawa-shi, Japan

Filed Apr. 5, 1989, Ser. No. 333,233

Claims priority, application Japan, Jul. 6, 1988, 63-169759; Aug. 10, 1988, 63-199096

Int. Cl.[5] F24F *7/00*

U.S. Cl. 52—1 15 Claims



1. A multi-level building structure with at least one elevator, said structure comprising:

a first section on each floor having at least one living area in which people work or live,

a second section on each floor through which at least one elevator shaft passes, said elevator shaft containing said elevator which passes therethrough, and an elevator en-

trance, said second section being separated from said first section by a predetermined distance,

a third section on each floor having at least one path connecting the living area in the first section and the elevator entrance in the second section, the third section having walls, a floor and a ceiling, the third section having a space over the ceiling having no side walls and being connected directly to the outdoors and separating the second section from the first section so that the first and second sections are connected only through the third section,

closable ventilation means on each floor formed at least on the ceiling of the path between the living area in the first section and the elevator entrance in the second section so that the path is connected directly to the outdoors through the space over the ceiling, in case of fire, the smoke and gas from the fire in the first section are exhausted before reaching the elevator entrance and people can safely wait to get on the elevator between said ventilation means and the elevator entrance, and

closing means associated with said ventilation means for closing said ventilation means so that the path is not open to the outdoors under normal conditions and is opened automatically in case of fire so that the smoke and gas from the fire are exhausted via said ventilation means.

4,961,293

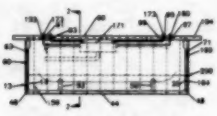
PRECAST, PRESTRESSED CONCRETE SECONDARY CONTAINMENT VAULT

Randall House, P.O. Box 700248, San Antonio, Tex. 78270; Jesse Covarrubias, San Antonio, Tex.; JoHann H. Hofmann, San Antonio, Tex., and Jerry Powell, San Antonio, Tex., assignors to Randall House, San Antonio, Tex.

Filed Jan. 10, 1989, Ser. No. 295,821

Int. Cl.[5] E04C *3/10*; E02D *29/14*

U.S. Cl. 52—21 **6 Claims**



1. A precast secondary containment vault for holding a large primary containment vessel, such as a gasoline storage tank, that may contain a hazardous fluid, said precast secondary containment vault being transportable over existing highways and allowing physical and visual inspection of said large primary containment vessel by a normal size human, said precast secondary containment vault isolating said large primary containment vessel from vertical and lateral forces external, caused in part by external fluids, to said large primary containment vessel and isolating said large primary containment vessel from corrosive affects of soil, said precast secondary containment vault comprising:

(a) a precast concrete bottom unit having a cavity therein for receiving said large primary containment vessel, said cavity being of sufficient size to hold all of said hazardous fluid if said large primary containment vessel was filled with said hazardous fluid and said large primary containment vessel leaked, said precast concrete bottom unit being

(i) pretensioned and reinforced, and

(ii) transportable over said highways;

(b) means for making said precast concrete bottom unit impermeable to said hazardous fluid;

(c) a precast concrete collar unit sized and shaped to fit on an upper portion of said precast concrete bottom unit, said precast concrete collar unit being

(i) pretensioned and reinforced, and

(ii) transportable over said highways;

(d) a reservoir joint for mating a lower portion of said precast concrete collar unit with said upper portion of said precast concrete bottom unit to form a substantially watertight seal therebetween;

(e) a precast concrete top unit removably secured to an upper rim of said precast concrete collar unit with sealing material therebetween, said precast concrete top unit

(i) allowing insertion or removal of said large primary containment vessel when said precast concrete top unit is removed,

(ii) being reinforced, and

(iii) being transportable over said highways;

(f) a manhole in said precast secondary containment vault allowing access therethrough by said human for said physical and visual inspection of said large primary containment vessel and possible repair without removing said large primary containment vessel from said precast secondary containment vault;

(g) means for supporting said large primary containment vessel above said upper surface of said cavity of said precast concrete bottom unit a distance sufficient to allow said physical and visual inspection of a lower surface of said large primary containment vessel by said human;

(h) means for access into said precast secondary containment vault to (1) a sump location point and/or (2) said large primary containment vessel, during normal usage said means for access allowing external connections therethrough to said large primary containment vessel while preventing said external fluids from entering said secondary containment vault; and

(i) said precast concrete bottom unit, said precast concrete collar unit and said precast concrete top unit forming said precast secondary containment vault that is watertight during normal usage, but allowing access to said large primary containment vessel; said precast concrete bottom unit, said precast concrete collar unit and said precast concrete top unit being capable of withstanding said vertical and lateral forces and said corrosive affects of said soil when assembled.

4,961,294

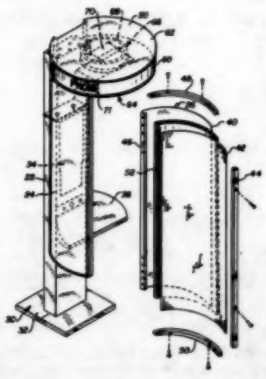
TELEPHONE ENCLOSURE

Robert J. Cameron, 6 Sedgwick Rd., Carmel, N.Y. 10512

Filed Jun. 19, 1989, Ser. No. 367,878

Int. Cl.[5] E04H *1/14*

U.S. Cl. 52—27 **13 Claims**



1. A telephone enclosure adapted to be mounted on a pedes-

tal or a wall or the like, said telephone enclosure comprising a backwall adapted to receive a telephone set and having an upper portion and a lower portion, and a pair of vertical arcuate walls mounted on opposite sides of said backwall and projecting forward from said backwall, the improvement which comprises at least one vertical arcuate wall having arcuate inside and outside sidewalls, arcuate top and bottom edge walls, and front and rear edge walls, at least one of said outside and inside arcuate sidewalls including a transparent sheet material whereby advertising display material can be mounted underneath said transparent sheet material,

said front edge wall is an elongated aluminum extrusion which is removably attached to said vertical arcuate wall,

said elongated aluminum extrusion has a base, two end walls, and two intermediate walls, whereby a central channel is defined by said intermediate walls, a first side channel is defined by one said end wall and an adjacent said intermediate wall, and a second side channel is defined by the other said end wall and the other said intermediate wall,

said intermediate walls extends from said base a greater distance than said end walls,

said inside sidewall is mounted in said first side channel, an insulating material is in said central channel and said outside sidewall is mounted in said second side channels, and

said inside sidewall is a perforated stainless steel panel and said outside sidewall being a transparent sheet material.

4,961,295

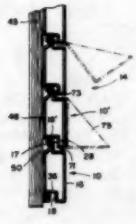
METAL SLAT AND WALL SYSTEM UTILIZING SAME

Paul Kosch, Sr., 14925 Boom Rd., and Paul J. Kosch, 15885 Vinecrest, both of Spring Lake, Mich. 49456

Filed Mar. 14, 1988, Ser. No. 167,644

Int. Cl.[5] A47B 5/00

U.S. Cl. 52—36 **15 Claims**



1. A slatted display wall assembly providing integral mounting means for display-support members, comprising in combination:

at least one generally rigid backing member having means defining a plurality of generally rigid projecting ears forming load-bearing slat supports;

a plurality of slats having central portions with an outer surface forming the front face of said wall assembly and flanged edge portions defining hanger means for mounting said slats, said slats being mountable adjacent one another and supported in place on said backing member through engagement of said flanged edge portion hanger means over the tops of said projecting ears from a position located at the front of said wall;

said edge portions being configured to define a recess between at least selected pair of said slats mounted adjacent one another on said projecting ears, said recess having a size and shape for receiving and mounting display support members in a manner such that they extend outward and beyond said front face of said slats;

said slats having sufficient structural strength to bear loading applied to said display support members at a point outboard of said front face without crushing of said central slat portion or edge portions, whereby loading placed upon said display support members is transferred to and carried by said projecting ear slat supports through said hanger means and flanged edge portions.

4,961,296

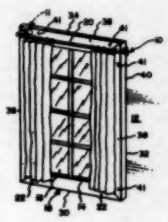
CURTAIN ROD HANGER

David F. Morehouse, 29 Mafalda, Cheektowaga, N.Y. 14225

Continuation of Ser. No. 176,664, Apr. 1, 1988, abandoned. This application Aug. 29, 1989, Ser. No. 401,500

Int. Cl.[5] A47H 1/00

U.S. Cl. 52—37 **10 Claims**



1. A curtain rod hanger in combination with a window or door frame assembly mounted within a wall including molding surrounding the periphery edge of said frame assembly adjoining the wall surface, said molding having a planar rear surface which generally opposes the surface of the adjoining wall surface, a front surface and an edge therebetween, said hanger comprising:

attachment means having an elongate portion adapted to be received solely between the planar rear surface of said molding and the adjoining wall surface; and

rod supporting means positioned between the front surface of said molding and the adjoining wall surface immediately adjacent the edge of said molding upon which a curtain rod is positioned between the front surface of said molding and the adjoining wall surface immediately adjacent the edge of said molding when operatively supported by the hanger, the rod supporting means including a projecting portion attached to the elongate portion so as to project from one side thereof so that when the elongate portion is securely positioned solely between the planar rear surface of said molding and the adjoining wall surface, the projecting portion is positioned perpendicular to the adjoining wall surface and the front surface of said molding immediately adjacent the edge of said molding.

4,961,297

TRANSPORTABLE WEATHER RESISTANT BUILDING ENCLOSURE

Samuel D. Bernard, 3303 Dolson Court, Mississauga, Ontario, Canada (L5L 4R5)

Filed Dec. 21, 1988, Ser. No. 287,439

Claims priority, application Canada, Dec. 7, 1988, 577170

Int. Cl.[5] E04B 7/00

U.S. Cl. 52—93 **24 Claims**

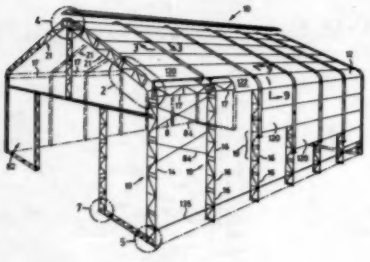
1. A weather resistant building enclosure comprising:

(a) an internal rigid load supporting framework comprising a plurality of columns, roof girders supported by said columns, and beams extending between and adjacent to said columns and said roof girders;

(b) an external load supporting surface comprised of a plurality of rigid transparent building panels, each panel having an inner layer, an outer layer and a plurality of stiffening webs running between said inner and outer layers, said panels transmitting solar light and heat into said building enclosure, each panel having two side edges, a lower edge and an upper edge, said penal having a width greater than

its height and being supported by said rigid framework along its side edges and further having an opening in said lower edge to flexibly retain the next adjacent lower panel therein; and

(c) a plurality of joint elements, said joint elements being located at the roof peak and along the eaves, to join the columns to the girders and to join the girders to girders on



the opposite roof face, said joint elements including eave joint elements said each joint elements comprising inner and outer generally parallel bent tubular elements, a plurality of cross braces fixed therebetween, a flat bar running generally vertical between said cross braces, and male and female attachement members at either end of said generally tubular elements.

4,961,298

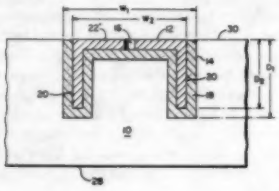
PREFABRICATED FLEXIBLE EXTERIOR PANEL SYSTEM

Jan Nogradi, Quality Lane, Box 219, Rutland, Vt. 05701

Filed Aug. 31, 1989, Ser. No. 401,015

Int. Cl.[5] E04B *2/28*

U.S. Cl. 52—235 **18 Claims**



1. An exterior wall panel, comprising:

a one-piece slab of plastic foam material having a pair of opposite major surfaces and a pair of opposite edge surfaces disposed between said opposite major surfaces, one of said major surfaces being divided by a plurality of substantially parallel, spaced-apart slots having cross-sections exhibiting a first width, a first depth and exhibiting first lengths extending between and open through said pair of opposite edge surfaces;

a plurality of elongate reinforcing members having a C-shaped cross-section with a second width less than said first width and a web joining a pair of oppositely disposed flanges having second depths less than said first depth and second lengths exceeding said first lengths, conformingly disposed within different ones of said slots, said web of each of said reinforcing members being flush with said one of said major surfaces and being perforated along said second lengths by a plurality of apertures; and

first adhesive means disposed within said slots for retaining said plurality of reinforcing members within corresponding ones of said slots within said one-piece slab, said first adhesive means consisting essentially of a water-based acrylic co-polymer binder.

4,961,299

BASEBOARDS FOR USE AS PLAYBOARDS AND/OR DISPLAYS

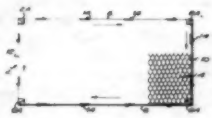
Lance R. Sheffield, Sevenoaks, England, assignor to Sandpiper Computer & Model Services Limited, Kemsing, England

Filed Jan. 25, 1989, Ser. No. 301,655

Claims priority, application United Kingdom, Jan. 28, 1988, 8801932

Int. Cl.[5] E04C *2/34*

U.S. Cl. 52—806 **14 Claims**



1. A baseboard comprising:

a core of open-cell material, said core having a plurality of corners, each corner having a cut-out section;

a strengthening corner block in each said cut-out section, each said corner block having at least one slot therein;

a closed box structure surrounding and totally enclosing said core; and

retaining means engaging in said at least one slot in each corner block for retaining said corner blocks in said cut-out sections and in position relative to said core and said closed box structure.

4,961,300

CAN SEAMER

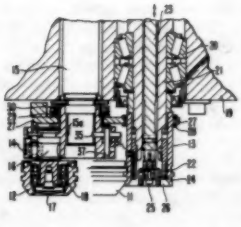
Hirokata Mihara, Tokyo; Koichi Takagi; Teruo Shimizu, both of Nagoya; Katsunori Tashiro, and Hideo Takahashi, both of Sunto, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1988, Ser. No. 291,789

Claims priority, application Japan, Dec. 29, 1987, 62-334109; May 19, 1988, 63-120756

Int. Cl.[5] B65B *7/28*; B21D *51/26*

U.S. Cl. 53—340 **5 Claims**



1. A can seamer apparatus for seaming a can lid to a can body, said apparatus comprising:

a rotary cylinder having a lower end portion;

a seaming chuck mountable axially on said lower end portion of said rotary cylinder by means of a spline or serration connection therebetween, such that said seaming chuck is rotatable with said rotary cylinder;

a seaming roll shart having a lower end portion;

a seaming lever mountable axially on said lower end portion of said seaming roll shaft by means of a spline or serration connection therebetween, such that said seaming lever is rotatable with said seaming roll shaft;

seaming rolls mounted on said seaming roll shaft; and

a connecting bracket connecting said seaming lever to said seaming chuck, such that said seaming lever and said seaming chuck are removable from and mountable on said seaming roll shaft and said rotary cylinder, respectively, as a unit with said connecting bracket.

4,961,301

PROCESS AND APPARATUS FOR THE CONTINUOUS MANUFACTURE OF FILTER PAPER BAGS FOR INFUSIONS, PROVIDED WITH THREAD AND TAG

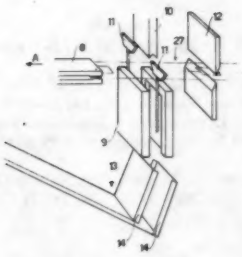
Federico Bonomelli, Via Mazzini, 18, 22042 Dolzago (CO), Italy

Filed Jul. 28, 1989, Ser. No. 387,345

Claims priority, application Italy, Apr. 13, 1989, 20133 A/89

Int. Cl.[5] B65B *29/04*

U.S. Cl. 53—413 **4 Claims**



1. A process for the making of filter paper bags with threads and tags for infusions, comprising:

punching out zones from a first paper sheet having one surface which is coated with thermosealable material;

cutting the first paper sheet into a series of first stripes each having a plurality of indentations defined by the zones with a plurality of teeth defined between the indentations;

folding the teeth of each first strip about a cotton thread which advances together with the first strip to form connected tags each having a portion of the coated surface exposed;

cutting each first strip to separate the tags, the separated tags being connected to each other by the thread of each first strip;

driving the thread and tags of each first strip to space the tags on the thread by lengths sufficient to engage the thread along opposite sides of bags to which the tags are to be connected;

applying the spaced tags of the first strips to a filter paper band along which the threads extend, using the exposed coated surface portions of the tags to obtain a continuous paper band to which there are applied, at regular intervals, a series of the spaced tags secured to the threads;

cutting said paper band along lines crossing the exposed coated surface portion of each tag so as to obtain a series of second strips each provided with a tag fixed at one side and a cotton thread connected to each tag;

pressing a lower edge of a filling funnel against an area of each second strip which is between two consecutive tags to fold and fill the second strip into an open bag around the funnel, having open side and top edges;

removing the funnel; and sealing the side and top edges of each bag closed.

4,961,302

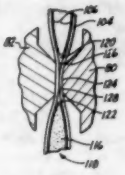
SEALING BARS HAVING ASYMMETRICAL SEALING SURFACES

Steven D. Davis, Yucaipa, Calif., assignor to W. A. Lane Inc., San Bernardino, Calif.

Filed May 30, 1989, Ser. No. 357,796

Int. Cl.[5] B65B *9/12, 51/30*

U.S. Cl. 53—451 **16 Claims**



1. A seal for a form, fill and seal pouch packaging machine comprising:

first and second opposing elongated seal bars;

said first seal bar having a hard smooth unyielding flat planar sealing surface thereon;

said second seal bar having a hard smooth unyielding non-planar arcuate sealing surface thereon, said arcuate sealing surface on said second bar shaped as a portion of a curved surface of rotation defined by a pair of distinct parallel linear side edges in a first direction and a pair of distinct arcuate side edges in a perpendicular direction with said surface of rotation extending continuously across the totality of said sealing surface; and

said arcuate sealing surface of said second seal bar convexly projecting towards said flat planar sealing surface of said first seal bar.

4,961,303

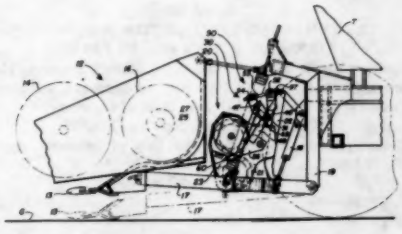
APPARATUS FOR OPENING CONDITIONING ROLLS

Horace G. McCarty, and Joseph C. Hurlburt, both of Lancaster, Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Jul. 10, 1989, Ser. No. 377,877

Int. Cl.[5] A01D *82/00*

U.S. Cl. 56—14.100 **9 Claims**



7. A conditioning mechanism for use in a crop harvesting machine having a crop gathering header operable to gather crop material from a field and convey said crop material to the conditioning mechanism for conditioning thereof, said crop gathering header being mounted on lift arms movably supported on said crop harvesting machine to effect a raising of said crop gathering header relative to the field, comprising:

a frame;

a lower roll rotatably mounted in a fixed orientation relative to said frame;

an upper roll rotatably mounted on pivot arms pivotally supported from said frame to permit movement of said upper roll toward and away from said lower roll;

a torsion bar operably connected to said upper roll such that a twisting of said torsion bar is operable to exert a biasing force urging the movement of said upper roll toward said lower roll; and

a mounting mechanism engaged with said torsion bar to form an anchoring support against which said torsion bar twists to create said biasing force, said mounting mechanism including an anchor pivotally interconnecting said mounting mechanism and one of said lift arms so that an upward movement of said lift arms to raise said crop gathering header effects a rotation of said torsion bar to reduce said biasing force.

4,961,304

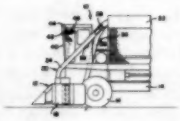
COTTON FLOW MONITORING SYSTEM FOR A COTTON HARVESTER

Jesse H. Ovaborn, Hinsdale, and Robert W. Hahn, Lemont, both of Ill., assignors to J. I. Case Company, Racine, Wis.

Filed Oct. 20, 1989, Ser. No. 424,393

Int. Cl.[5] A01D *45/18*; G08B *21/00*

U.S. Cl. 56—10.2 **13 Claims**



1. In a cotton harvester having a harvesting unit for removing cotton from plants, a walled duct extending from the harvesting unit, means for directing cotton from the harvesting unit into the duct and propelling the cotton through the duct, and a cotton flow monitoring system comprising:

acoustic means arranged along said duct for generating an output as a function of the sound created by the cotton impinging upon said duct; and

means for providing a signal to an operator of the harvester in response to the output received from said acoustic means to indicate cotton flow through said duct.

4,961,305

AGRICULTURAL IMPLEMENT FOR HARVESTING OF CORN AND OTHER GRAIN FRUITS

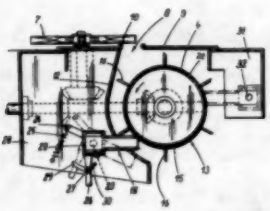
Heinrich Ostrup, Harsewinkel, and Lambert Sanders, Herzebrock-Clarholz, both of Fed. Rep. of Germany, assignors to Claas OHG, Harsewinkel, Fed. Rep. of Germany

Filed Aug. 3, 1988, Ser. No. 227,899

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1987, 3726967

Int. Cl.[5] A01D *45/02*

U.S. Cl. 56—98 **4 Claims**



1. An agricultural implement for harvesting corn or other grain fruits to be used especially as a front implement as a harevester thresher, comprising drawing means; means forming a picking gap for separating cobs from a fruit; a picking roller surrounded by a partial casing and having a cylindrical base body with a plurality of impact plates provided with cutouts, said partial casing including an opening; cutting means provided with a plurality of cutting members extending through said opening and said cutouts, said cutting means having an end which is opposite to said cutting members; a joint traverse supporting said cutting means at said end independently of said partial casing and turnable about an axis extending parallel to an axis of said picking roller, said traverse together with said cutting means being turnable between two end positions against a spring force about an axis which extends parallel to an axis of said base body and being arrestable upon turning; a pulling spring cooperating with said traverse so as to produce said spring force; a lever which is fixedly connected with said traverse and has a free end engaging said pulling spring; an adjusting lever connected with said traverse and carrying a clamping pin; and means forming a longitudinal guiding opening in which said clamping pin is guided and fixed, said means including a machine wall in which said longitudinal opening is provided.

4,961,306

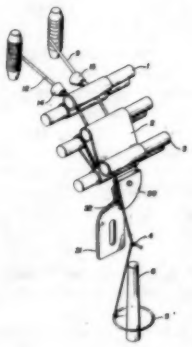
SYSTEM FOR PRODUCING STAPLE-WRAPPED CORE YARN

A. Paul S. Sawhney, Metairie; Craig L. Folk, New Orleans; Kearny Q. Robert, New Orleans, and Linda B. Kimmel, New Orleans, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 24, 1990, Ser. No. 469,120

Int. Cl.[5] D02G *3/36*, *3/38*; D01H *13/04*

U.S. Cl. 57—12 **29 Claims**



1. A method for forming core/wrap yarn comprising

a. supplying a core of continuous filament or fibrous material from a draft roll nip to a wrapping point through a first channel, said channel being essentially straight and perpendicular to said nip;

b. supplying a first wrap strand from said nip through a second channel which merges with said first channel at said wrapping point to form core/wrap yarn, wherein said wrap strand is spaced from said core at said nip, wherein said second channel is curved to guide said wrap strand to said wrapping point in a convex pathway with respect to said first channel; and

c. passing said core/wrap yarn to a wind-up spindle.

14. Apparatus for forming core/wrap yarn comprising

a. a pair of draft rolls having a nip therebetween;

b. a first channel adjacent said nip, extending from said nip to a wrapping point, to supply a core to said wrapping point,

said channel being essentially straight and perpendicular to said nip; and

c. a second channel adjacent said nip, extending from said nip to merge with said first channel at said wrapping point to supply a first wrapping strand to said wrapping point to form core/wrap yarn at said wrapping point, wherein said wrapping strand is spaced from said core at said nip, wherein said second channel is curved to guide said wrapping strand to said wrapping point in a convex pathway relative to said first channel.

4,961,307

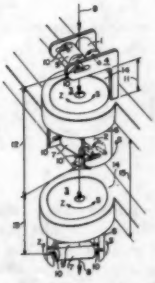
TEXTILE PROCESSING EMPLOYING A STRETCHING TECHNIQUE

Paul P. Cook, 515 Exeter, Unit A-6, San Antonio, Tex. 78209

Filed Aug. 9, 1989, Ser. No. 390,947

Int. Cl.[5] D01H *13/12, 5/28*

U.S. Cl. 57—310 **4 Claims**



1. The method of stretch treating every individual fiber of any type that is in an input configuration of substantial uniform thickness, said method comprising the steps of:

a. providing a means of feeding such input fiber at a desired input feed rate into a fiber stretch processing zone,

b. providing a fiber stretch processing zone between two stretching points,

c. adjusting such stretching points a distance apart and setting them at least greater than the longest staple fiber,

to obtain the minimum stress duration time desired,

to obtain the production rate desired allowing such stress duration time, and

to obtain the degree of stretch processing uniformity desired throughout such distance,

d. providing a means of twisting such input fiber within such fiber stretch processing zone at the desired twisting rate relative to the input flow rate so as to virtually prohibit relative slippage or drafting of the individual fibers relative to one another,

e. providing a means of simultaneously stretching such input fiber within such fiber stretch processing zone at the desired stretching rate relative to the input flow rate,

to subject every such individual fiber simultaneously to substantial twisting and substantial stretching for precisely correct stretching against twist processing in the required relative amounts

to each other and

to the input count,

as required by the characteristics of such input fiber to obtain the stretch processing results desired,

without substantial breakage of the fibers,

whereby such input fiber's

net strength properties are increased and

every individual fiber molecular structure is altered and improved and

wherein the uniformity of the output fibers is also improved throughout their length.

4,961,308

MACHINE FOR PNEUMATIC FALSE-TWIST SPINNING

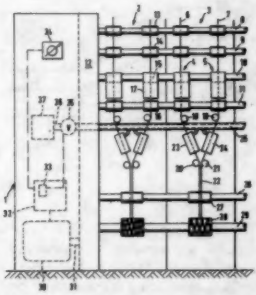
Hans Braxmeier, Süssen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Filed Aug. 29, 1988, Ser. No. 237,331

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1987, 3729426

Int. Cl.[5] D01H *5/28, 1/24, 1/28, 15/02*

U.S. Cl. 57—328 **17 Claims**



1. A process for stopping and restarting a machine for pneumatic flase-twist spinning having a plurality of spinning units which each have at least one drafting frame, one pneumatic flase-twisting nozzle, one withdrawal device, and one wind-up device, wherein a main motor is provided for driving the drafting frames, the withdrawal devices and the wind-up devices, wherein a blower motor is provided for a blower which is connected with the air nozzle via at least one solenoid valve, said process comprising:

switching the main motor off and on for the stopping and restarting;

controlling the start-up time and the slow-down time of the main motor to preselected values, and

controlling the operation of the blower motor and the at least one solenoid valve as a function of the main motor rotational speed.

4,961,309

APPARATUS FOR VENTING THE ROTOR STRUCTURE OF A COMPRESSOR OF A GAS TURBINE POWER PLANT

Josef Liebl, Dachau, Fed. Rep. of Germany, assignor to MTU Motoren-Und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 20,125, Feb. 27, 1987, abandoned. This application Apr. 21, 1989, Ser. No. 341,801

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1987, 3606598; Jan. 12, 1987, 3627306

Int. Cl.[5] F02C *7/18*

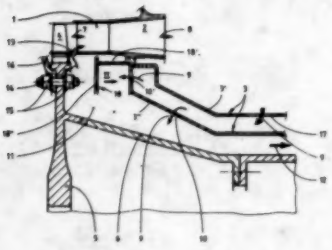
U.S. Cl. 60—39.07 **16 Claims**

1. Apparatus for venting the rotor of a multistage compressor of a gas turbine power plant is which the compressor, a combustion chamber and a turbine of the power plant are arranged in sequence, said compressor including an axial diffuser located downstream of rotor and stator vanes at the last stage of the compressor, said apparatus comprising:

an annular chamber disposed between first and second wall surfaces, the first wall surface being formed by a rear surface of the last rotor disk of the compressor and a member extending from the rotor disk, the second wall surface being formed by a housing for said combustion

chamber, said stator vanes and said axial diffuser, the housing for said combustion chamber having a row of circumferentially spaced openings for supply of a venting portion of compressed air discharged from said axial diffuser into said annular chamber;

said annular chamber having one outlet for flow of a first portion of said venting portion as a discharge stream to a secondary air system of the turbine for cooling purposes thereof and a second outlet for flow of a second portion of said venting portion as a recycle stream flowing towards the rear surface of said last rotor disk and then to said



compressor via an annular slot provided between the rotor and stator vanes at the last compressor stage;

said last rotor disk producing friction at its rear surface in the compressed air in said annular chamber, said openings in said housing being located in relation to a region of maximum friction generated in said chamber; and

stationary and radially extending guide means in said annular chamber facing said openings so that said venting portion entering said annular chamber is formed into said first and second portions and said second portion is guided into said region of maximum friction and to said annular slot.

4,961,310

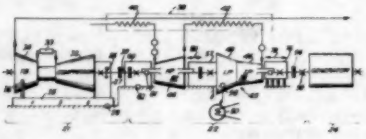
SINGLE SHAFT COMBINED CYCLE TURBINE

James H. Moore; Klaus M. Retziaff, both of Schenectady, and Kenneth E. Robbins, Saratoga, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 3, 1989, Ser. No. 374,812

Int. Cl.[5] F02C *7/20*

U.S. Cl. 60—39.182 **9 Claims**



1. In a combined cycle plant having a gas turbine, a steam turbine, and a generator all being disposed on a foundation and arranged in tandem in the order aforementioned on a single shaft system having a single thrust bearing and a plurality of rigidly coupled rotor members, the improvement comprising:

said thrust bearing being supported on first means keyed to said foundation on the side of said steam turbine toward said gas turbine to restrain axial movement of said single shaft system,

said steam turbine comprising a reheat steam turbine having a first casing supported at one end thereof on second means keyed to said foundation adjacent said thrust bearing to be restrained against axial movement,

said reheat turbine having an exhaust hood and having a second casing supported at least in part within said exhaust hood, said second casing being supported on third means keyed to said foundation near the center of the exhaust hood outlet, whereby said first and second casings grow thermally independently of one another and independently of said single shaft system.

4,961,311

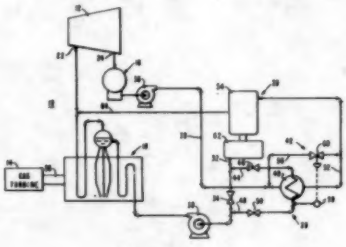
DEAERATOR HEAT EXCHANGER FOR COMBINED CYCLE POWER PLANT

James Pavel, Lake Mary, and Bennie L. Richardson, Winter Park, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 29, 1989, Ser. No. 414,850

Int. Cl.[5] F02C *6/00*

U.S. Cl. 60—39.182 **18 Claims**



1. A combined cycle power plant, comprising:

a steam turbine including an inlet portion for receiving motive steam and an exhaust portion for exhausting said motive steam that is spent by said steam turbine;

a condenser connected to said exhaust portion of said steam turbine for receiving said spent motive steam and for condensing said spent motive steam to a supply of condensate;

a gas turbine including an exhaust portion for exhausting waste heat that is produced by said gas turbine in the form of exhaust gases;

a heat recovery steam generator connected between said exhaust portion of said gas turbine and said steam turbine, for receiving said waste heat exhausted by said gas turbine, for generating said motive steam from a supply of feedwater heated by said waste heat, and for supplying said motive steam to said steam turbine;

a deaerator connected to said condenser for receiving said supply of condensate and for deaerating said condensate to provide said supply of feedwater to said heat recovery steam generator; and

a heat exchanger connected between said supply of condensate and said deaerator, as well as between said deaerator and said heat recovery steam generator, for exchanging heat from said supply of feedwater from said deaerator to heat said supply of condensate prior to its receipt by said deaerator.

4,961,312

METHOD FOR CONTROLLING AUGMENTOR LINER COOLANT FLOW PRESSURE IN A MIXED FLOW, VARIABLE CYCLE GAS TURBINE ENGINE

John R. Simmons, Montgomery, Ohio, assignor to General Electric Company, Cincinnati, Ohio

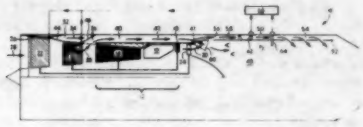
Division of Ser. No. 57,642, Jun. 8, 1987, Pat. No. 4,813,229, which is a continuation of Ser. No. 708,181, Mar. 4, 1985, abandoned. This application Sep. 9, 1988, Ser. No. 242,098

Int. Cl.[5] F02K *3/075, 3/10*

U.S. Cl. 60—204 **8 Claims**

1. In a mixed flow, variable cycle gas turbine engine having a bypass flow in a bypass duct and means to vary the bypass flow pressure and having an augmentor and liner with coolant

supplied by a portion of said bypass flow and an exhaust duct surrounding said augmentor and liner which is positioned within said exhaust duct so as to form a cooling plenum therebetween, a method for modulating the bypass flow pressure comprising:



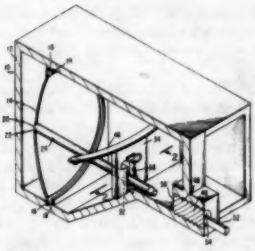
sensing at least a first control pressure P_1 in said plenum and varying said bypass flow pressure in said bypass duct as a function of at least said first control pressure P_1.

4,961,313

THERMALLY INITIATED MECHANICALLY FIRED DEVICE FOR PROVIDING PROTECTION AGAINST SLOW COOK-OFF

Cyril F. Dolan, Pacific Palisades, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 8, 1988, Ser. No. 229,662
Int. Cl.[5] F02K *9/38*
U.S. Cl. 60—223 **18 Claims**



1. A rocket having a thermally actuated rocket motor safety apparatus comprising:

a main rocket body;

a rocket motor coupled to said rocket body and thermally coupled to an ambient environment; and

said safety apparatus, said safety apparatus comprising:

first means for sensing the temperature of said ambient environment and generating a mechanical response when said temperature reaches a first predetermined temperature indicating substantial slow cook-off hazard of said rocket motor;

a housing mechanically coupled to the main rocket body and thermally coupled to the ambient environment, said first means including a bimetallic spring disposed in said housing and thermally coupled to said housing;

said means for triggering the deactivation of the propulsive thrust capability of said rocket motor in response to said mechanical response generated by said first means for sensing said first temperature;

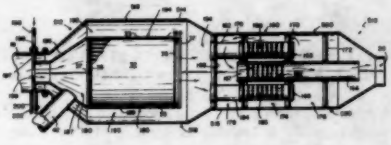
whereby slow cook-off hazard of said rocket motor is substantially avoided.

4,961,314

TUNED EXHAUST PROCESSOR ASSEMBLY

Michael G. Howe; James C. Arthur, and Robert T. Usleman, all of Columbus, Ind., assignors to Arvin Industries, Inc., Columbus, Ind.

Continuation-in-part of Ser. No. 232,023, Aug. 15, 1988. This application Mar. 6, 1989, Ser. No. 319,069
Int. Cl.[5] F01N *3/02*
U.S. Cl. 60—288 **29 Claims**



1. An exhaust processor assembly comprising

a housing formed to include an inlet and an outlet,

a partition positioned in an upstream portion of the housing in close proximity to the inlet for dividing the upstream portion of the housing into at least two regions,

a substrate situated in a first region of the upstream portion of the housing and configured to collect particulate matter entrained in combustion product introduced into the first region through the inlet, and

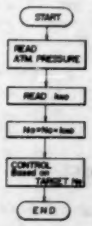
a muffler situated in a downstream portion of the housing in close proximity to the outlet to attenuate noise generated by combustion product passing through the housing toward the outlet, the muffler being spaced apart from the partition, the housing including a top shell and a bottom shell, the partition including a flange trapped between portions of the top and bottom shells to secure the partition in its position within the housing, the partition and the bottom shell cooperating to define the first region, extending between the partition and the bottom shell.

4,961,315

METHOD OF CONTROLLING SPEED REDUCTION RATIO OF CONTINUOUSLY VARIABLE SPEED TRANSMISSION

Yoshikazu Ishikawa, and Kouji Yamaguchi, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1988, Ser. No. 251,567
Claims priority, application Japan, Oct. 12, 1987, 62-256715
Int. Cl.[5] F16H *61/42*
U.S. Cl. 60—327 **14 Claims**



9. A method of controlling a speed reduction ratio of a continuously variable transmission in a vehicle, said transmission being driven by an engine, comprising the steps of

determining an atmospheric pressure,

comparing said atmospheric pressure with a reference pressure,

determining a correction factor according to a difference

between said atmospheric pressure and said reference pressure,

determining a reference engine speed according to a driver's intention of acceleration or deceleration, as indicated by an opening of an engine throttle,

determining a corrected reference engine speed according to said correction factor, and

controlling said speed reduction ratio as necessary to adjust an actual speed of said engine to match said corrected reference engine speed.

4,961,316

CONTROLLED ELECTRIC PUMP DRIVE FOR HYDRAULIC LIFTING ARRANGEMENT WITH GAS SPRING IN MOTOR

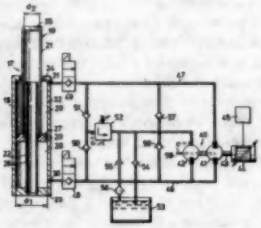
Andrew Corke, and Lennart Johansson, both of Mjölby, Sweden, assignors to BT Industries Aktiebolag, Mjölby, Sweden

Filed Oct. 21, 1988, Ser. No. 261,239

Claims priority, application Sweden, Oct. 28, 1987, 8704216

Int. Cl.[5] B66F *9/22*

U.S. Cl. 60—431 **9 Claims**



1. A hydraulic lifting arrangement for a lift on a materials-handling vehicle, said arrangement comprising a working piston-cylinder device which includes a cylinder housing having axially movable therein a piston with a hollowed piston head and a hollow piston for raising and lowering the lift assembly, and further comprising a pump assembly which co-acts with a system of pipes for operating the piston-cylinder device, and an electric motor for driving the pump assembly; wherein the piston-cylinder device is a double-acting device having a first and a second working chamber which are isolated sealingly from one another, and includes a tube which extends into the piston head of the piston rod and sealingly delimits a pressure chamber arranged to act as an integrated gas spring for biassing the piston-cylinder device; the pump assembly includes a first and a second hydraulic pump of which at least the first pump is a reversible pump, and the pumps are mutually connected in parallel.

4,961,317

OLEOPNEUMATIC INTENSIFIER CYLINDER

Michael H. Wolfbauer, III, Roseville, Mich., assignor to Savair, Inc., St. Clair Shores, Mich.

Filed Sep. 18, 1989, Ser. No. 408,920

Int. Cl.[5] F15B *15/22*

U.S. Cl. 60—560 **36 Claims**

1. An apparatus for intensifying a force that is applied to a tool to move said tool into and out of engagement with a workpiece, said apparatus comprising:

a master cylinder having a first manifold, a second manifold adjacent said first manifold and a third manifold spaced relative said first and second manifolds, said first, second and third manifolds each having at least one aperture therein, said first, second and third manifolds being axially aligned and in spaced apart relationship to one another;

means for forming a first cavity between said first and second manifolds;

means for forming a second cavity between said second and third manifolds;

an intensifier piston positioned in said first cavity, said intensifier piston defining first and second chambers in said first cavity;

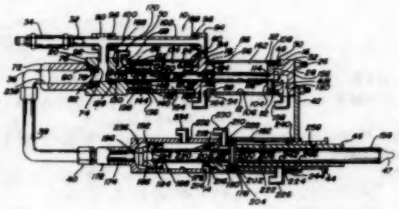
a reservoir piston positioned in said second cavity, said reservoir piston defining third and fourth chambers in said second cavity, said reservoir piston having a central bore therein;

an intensifier rod coupled to said intensifier piston, said intensifier rod passing through said at least one aperture in said second manifold and said central bore of said reservoir piston;

an actuating cylinder positioned in juxtaposed relationship with respect to said master cylinder;

means for forming a third cavity within said actuating cylinder;

a piston positioned in said third cavity of said actuating cylinder, said piston defining fifth and sixth chambers on each side of said piston; said third chamber adjacent said reservoir piston and said sixth chamber adjacent said piston each containing hydraulic fluid;



passage means for placing said third and sixth chambers in fluid communication with each other, said passage means communicating with said second and third manifold at one end and having an opposite end attached to said actuating cylinder;

a piston rod attached to said piston, said piston rod having a free end cantilevered from said actuating cylinder;

means for introducing pressurized pneumatic fluid to said fourth chamber adjacent said reservoir piston to cause said reservoir piston to force hydraulic fluid from said reservoir piston third chamber into said actuating cylinder sixth chamber that is adjacent to said piston, such that said piston and said attached piston rod advances at a first predetermined rate toward said workpiece; and

means for introducing pressurized pneumatic fluid to said first chamber adjacent said intensifier piston to cause said intensifier piston to move and further to move said coupled intensifier rod into one end of said passage means and act on said hydraulic fluid in said sixth chamber such that said hydraulic fluid is intensified for introduction to said actuating cylinder sixth chamber that is adjacent said piston to cause said piston rod attached to said piston to advance at a second predetermined rate toward said workpiece.

4,961,318

ASSISTED HYDRAULIC BRAKING SYSTEM AND BOOSTER AND CONTROL VALVE DESIGNED FOR SUCH A SYSTEM

Jean-Jacques Carré, Le Raincy, France, assignor to Bendix France, Drancy, France

Filed Oct. 31, 1989, Ser. No. 430,744

Claims priority, application France, Nov. 10, 1988, 88 14730

Int. Cl.[5] F15B *3/00*

U.S. Cl. 60—579 **5 Claims**

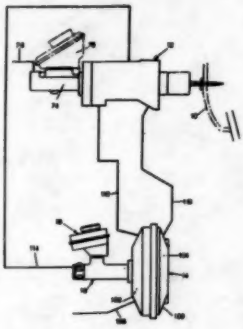
1. An assisted hydraulic braking system comprising :

a brake pedal connected to an actuating rod,

a pneumatic brake booster comprising a front vacuum chamber and a rear working chamber separated by a movable deformable partition acting on a push rod,

a single master cylinder piston of which is acted on by said push rod,

means for controlling the booster, comprising shutter means putting a first chamber selectively in communication with one of a second chamber and atmosphere responsive to an actuation of the brake pedal,



a first pipeline putting the first chamber of the control means in communication with the working chamber of the booster,

a second pipeline putting the second chamber of the control means in communication with the vacuum chamber of the booster,

a second master cylinder having outlets of which are connected to at least one wheel brake, said the second master cylinder being subjected to the actuating pressure transmitted by the actuating rod and increased by the boosting pressure generated by the single master cylinder.

4,961,319

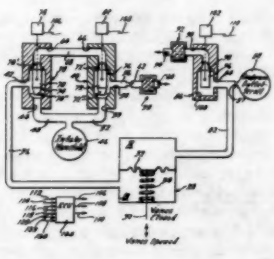
METHOD OF TURBOCHARGER CONTROL

Kim M. Lyon, Bloomfield Hills, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 22, 1988, Ser. No. 289,177

Int. Cl.[5] F02B *37/12*

U.S. Cl. 60—602 **32 Claims**



14. In a vehicle having an engine and a turbocharger for increasing the density of at least the air entering a cylinder of the engine, the turbocharger including at least a compressor and a turbine coupled by a shaft and a nozzle to increase the angular momentum of the flow of gas to the turbine, the nozzle having a housing and movable vanes to vary the angle and velocity that the exhaust gas hits the wheel of the turbine, an actuator for moving the vanes, a can separated by a diaphragm and having an A side and B side for actuating the actuator, a plurality of solenoid-actuated valves for controlling the pressure in the A and B sides of the can, an electronic control unit (ECU) having memory for storing data and predetermined values and for actuating and de-actuating the solenoid-actuated valves, a plurality of inputs to the ECU for providing input data indicative of engine temperature, engine speed, vehicle speed, intake manifold pressure, throttle angle, engine knock and charge air temperature, method for controlling the position of pivotally mounted vanes movable between open and closed operative positions to control gas flow to the turbine, said method comprising the steps of:

checking whether the engine throttle is open;

checking whether the throttle is wide open if the throttle is open;

determining whether the vehicle is moving if the throttle is not wide open;

determining whether the engine temperature is above a predetermined temperature if the vehicle is not moving;

determining whether the manifold absolute pressure (MAP) is greater than the barometric pressure if the engine is not above the predetermined temperature;

determining whether the engine RPM is greater than a predetermined RPM value if the engine temperature is above the predetermined temperature; and

opening the vanes to a maximum position if MAP is not greater than the barometric pressure.

4,961,320

CONVEYING AND STORAGE DEVICE FOR THERMOSENSITIVE PRODUCTS

Klaus Gutmann, Wagramerstrasse 93/2, A 1220 Wien, Austria

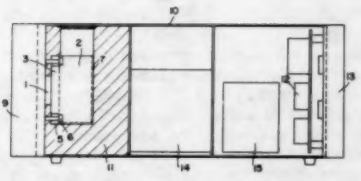
PCT No. PCT/AT88/00035, § 371 Date Jan. 19, 1989, § 102(e) Date Jan. 19, 1989, PCT Pub. No. WO88/09467, PCT Pub. Date Dec. 1, 1988

PCT Filed May 19, 1988, Ser. No. 313,980

Claims priority, application Austria, May 20, 1987, 1287/87; May 13, 1988, 255/88

Int. Cl.[5] F25B *21/02*

U.S. Cl. 62—3.2 **7 Claims**



1. Conveying and storage device for thermosensitive products, comprising a storage chamber, at least one Peltier element disposed adjacent one wall of said storage chamber for controlling the temperature within said storage chamber, and a plurality of hollow tubular heat-conducting members disposed adjacent said at least one Peltier element and defining said one wall of said storage chamber, wherein said plurality of hollow tubular heat-conducting members are prismatic in cross section and arranged in side-by-side relation between said storage chamber and said at least one Peltier element, thereby to define a substantially uniplanar heat-conducting surface facing into said storage chamber for maintaining a substantially uniform temperature within said storage chamber.

4,961,321

BIS (DIFLUOROMETHYL) ETHER REFRIGERANT

Gerald J. O'Neill, and Robert S. Holdsworth, both of Arlington, Mass., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Feb. 28, 1989, Ser. No. 316,627
Int. Cl.[5] C09K 5/02
U.S. Cl. 62—114 10 Claims

1. A process for producing refrigeration comprising:

(a) condensing a refrigerant compound formed of bis (difluoromethyl) ether, and

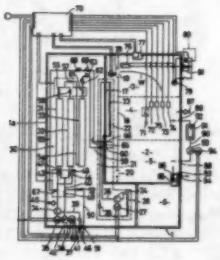
(b) thereafter evaporating the refrigerant in the vicinity of a body to be cooled.

4,961,322

FRESH FOOD STORING DEVICE

Tomio Oguma, Anjo, and Yasuhiro Aso, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kuisha, Japan

Filed Dec. 28, 1988, Ser. No. 291,144
Claims priority, application Japan, Dec. 28, 1987, 62-333064; Dec. 28, 1987, 62-333067
Int. Cl.[5] A23K 3/02
U.S. Cl. 62—179 6 Claims



1. A fresh food storing device comprising:

means defining a storing volume for storing fresh foods;

a box surrounding said storing volume;

a temperature detecting means installed in said box for sensing the temperature of the gas within said storing volume;

cooling means installed in said box for cooling said storing volume;

a nitrogen-rich gas supplying means installed in said box for supplying a nitrogen-rich gas into said storing volume;

a controller having means for activating said cooling means in response to a signal from said temperature detecting means for controlling the temperature of said storing volume, and means for activating said nitrogen-rich gas supplying means in response to a variation of the gas content of said storing volume for controlling the gas content of said storing volume; and

gas circulating means for circulating the gas in said storing volume,

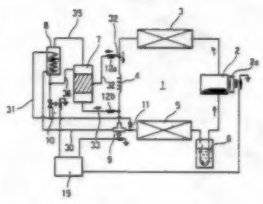
wherein said storing volume is elongate in height and is provided with a separating wall which has a first opening and a second opening, and wherein said nitrogen-rich gas supplying means is disposed between said partitioning means and said box, an evaporation means of said cooling means is disposed between said first and second openings, a nitrogen-rich gas outlet for said nitrogen-rich gas supplying means is disposed between said evaporation means and said second opening, and said gas circulation means is disposed near said first opening.

4,961,323

AUTOMOTIVE AIR CONDITIONER

Kiyoharu Katsuna, Anjo; Kenji Ogura, Kariya, and Toshio Hirata, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 24, 1989, Ser. No. 342,082
Claims priority, application Japan, Apr. 25, 1988, 63-101589
Int. Cl.[5] B60H 1/32
U.S. Cl. 62—244 10 Claims



1. An automotive air conditioner using a non-azeotropic mixed-type refrigerant of a higher boiling point refrigerant and a lower boiling point refrigerant comprising;

a compressor sucking, compressing and discharging the refrigerant,

a condenser condensing the refrigerant discharged from said compressor,

an expansion means provided downstream of said condenser for expanding the refrigerant passing therethrough,

a rectifying means for separating the refrigerant into a gas phase refrigerant wherein the percentage of the lower boiling point refrigerant contained therein is high and a liquid phase refrigerant wherein a percentage of the higher boiling point refrigerant contained therein is high, said rectifying means being connected to a refrigerant circuit between said condenser and said expansion means so that the refrigerant condensed within said condenser is introduced into said rectifying means, and said rectifying means being connected to the refrigerant circuit between said expansion means and said evaporator so that the liquid phase refrigerant separated within said rectifying means is introduced toward said evaporator,

a cooling means for cooling the gas phase refrigerant separated within said rectifying means and for accumulating the refrigerant wherein the percentage of the lower boiling point refrigerant therein is high, said cooling means being connected to said rectifying means via an inlet conduit so that the gas phase refrigerant separated within said rectifying means is introduced into an upper portion of said cooling means through said inlet conduit, and said cooling means being connected with said rectifying means via an outlet conduit so that the refrigerant condensed within said cooling means returns to said rectifying means, said cooling means having an heat exchanger therein for cooling the refrigerant introduced from said rectifying means through said inlet conduit, said heat exchanger being connected with the refrigerant circuit downstream of said expansion means and upstream of said compressor so that the low temperature refrigerant circulating in the refrigerant circuit is introduced into said heat exchanger, and

a control valve means for switching a flow of the refrigerant circulating in the refrigerant circuit into a first condition wherein the refrigerant circulating in the refrigerant circuit is not introduced into said heat exchanger and a second condition wherein the refrigerant circulating in the refrigerant circuit is introduced into said heat exchanger,

a conduit for connecting said cooling means to the refrigerant circuit, said conduit having an on-off valve means so that the refrigerant condensed and accumulated in said

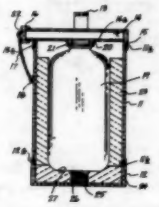
cooling means is introduced into the refrigerant circuit when said on-off valve means opens said conduit.

4,961,324

REFRIGERATED BEVERAGE CONTAINER

Barry S. Allan, 5179 El Claro Cir., West Palm Beach, Fla. 33415

Filed Jan. 25, 1990, Ser. No. 470,263
Int. Cl.[5] B67D *5/62*
U.S. Cl. 62—400 **9 Claims**



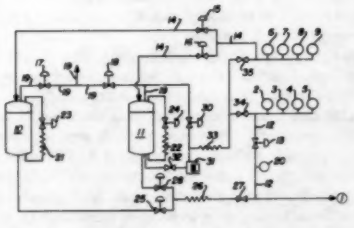
1. A refrigerated beverage container apparatus comprising:
a combination, an annular beverage container defined by a predetermined height, a contoured bottom surface, and
a coaxially aligned threaded container spout formed at an upper end of the beverage container, and
the apparatus comprising a tubular central container body including a threaded upper end and a threaded lower end, and
a bottom cap threadedly securable to the threaded lower end, and
a top cap securable to the threaded upper end, and
the bottom cap including a first refrigerant chamber means for receiving the container bottom surface thereon, and
the central container body including a second annular refrigerant chamber means defining a coaxially aligned bore therethrough for surroundingly and complementarily receiving the beverage container therewithin, and
a top dispensing cap means mounted to the top cap for selectively dispensing a quantity of fluid from the beverage container.

4,961,325

HIGH PRESSURE GAS SUPPLY SYSTEM

Thomas G. Halvorson, Lockport, and Herbert R. Schaub, East Amherst, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 7, 1989, Ser. No. 404,279
Int. Cl.[5] F17C *7/04*
U.S. Cl. 62—48.1 **17 Claims**



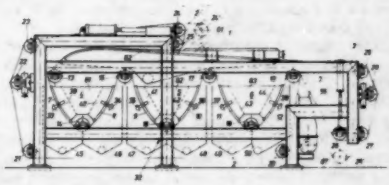
1. A method for supplying gas to a use point at a high delivery pressure without the need for a pump comprising:
(A) maintaining a liquid supply at a pressure less than the delivery pressure and a gas supply at a pressure at least equal to the delivery pressure;
(B) passing gas from the gas supply to the liquid supply to raise the pressure of the liquid supply to at least the delivery pressure;
(C) vaporizing liquid from the liquid supply to produce gas at a pressure a least equal to the delivery pressure; and
(D) passing gas produced in step (C) to the use point above the critical temperature at the high delivery pressure so that the high delivery pressure does not cause any liquefaction of the gas, said gas being passed without the need for a pump, and using the gas at the use point.

4,961,326

MATERIAL PROCESSING SYSTEM

Johann Sbaschnigg, and Franz Resch, both of Graz, Austria, assignors to Maschinenfabrik Andritz Actiengesellschaft, Graz, Austria

PCT No. PCT/AT87/00052, § 371 Date Jul. 13, 1988, § 102(e) Date Jul. 13, 1988, PCT Pub. No. WO88/02044, PCT Pub. Date Mar. 24, 1988
PCT Filed Sep. 16, 1987, Ser. No. 199,239
Claims priority, application Austria, Sep. 17, 1986, 2487/86
Int. Cl.[5] D06B *5/08*
U.S. Cl. 68—9 **46 Claims**



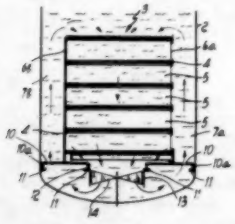
1. An apparatus for the treatment of a material, including at least two endless belts, means for moving said belts simultaneously, said belts being confronted along at least a portion of their path, means for placing the material between the belts at the confronted portion of their path, at least two stationary containers serving for the reception and discharge of a treatment medium, said containers being spaced from each other and one behind the other horizontally in travel direction of the belts, a roller arranged between the containers for passing the belts with the material being conveyed after passing a single treatment container, means for passing the belts with the material lodged therebetween around said containers and over said roller, said containers being provided with inlets and outlets for said treatment medium, the improvement to said stationary treatment containers comprising: said containers being positioned for passage of said belts around and below said containers; means for feeding said treatment medium from on top of the belts for passage between said belts and the material contained between said belts; said stationary containers defining an outer shape of a wedge, said wedge with a plane of symmetry, said plane being vertically directed and said wedge being arranged with a top upwardly exposed and being provided with a downward cut-off edge with sidewalls extending between said cut-off edge and said top; said belts at said confronted portion of their path being passed from below serially around at least two of the containers and over said at least one roller provided between upper ends of said containers whereby said belt passes in a horizontal, undulating path; said containers being provided on at least part of their sidewalls facing the belts with discharge openings for the treatment medium.

4,961,327

APPARATUS FOR DYEING AND BLEACHING YARNS AND TEXTILE PRODUCTS IN GENERAL

Piergiovanni Bolzoni, Stelvio, and Marino A. Cutrone, Giornate, both of Italy, assignors to Cubotex S.r.l., Milan, Italy

Filed Jun. 2, 1989, Ser. No. 360,686
Claims priority, application Italy, Jun. 9, 1988, 20918 A/88
Int. Cl.[5] D06B 5/00
U.S. Cl. 68—27 8 Claims



5. Apparatus for dyeing and bleaching yarns and textile products in general, comprising a substantially cylindrical treatment tank with a substantially vertical axis and a support structure for the products to be treated which can be upwardly extracted from said treatment tank, wherein said support structure comprises a support framework and a plurality of drawers suitable for containing the products to be treated, said drawers being stacked one on top of the other and extractable from said support framework, means being provided for circulating a treatment liquid in one direction through said drawers, which are permeable to said treatment liquid, and, in the opposite direction, through an interspace defined between the inner wall of said treatment tank and at least one lateral portion of said support structure, a duct being defined in said treatment tank, said duct being open below said support structure in a central region, said means for circulating the treatment liquid being arranged in said duct, said means generating a current which rises through said drawers and a current which descends through said interspace or vice versa, means being provided in said treatment tank for resting said support structure to position said support structure above said duct, said support framework being downwardly provided with a plate with a circular configuration with dimensions which are substantially equal to the internal cross-section of said treatment tank, said plate being centrally provided with a passage at said duct and being perforated over the area forming the bottom of said interspace.

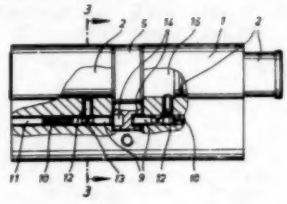
4,961,328

LOCK BIT ARRESTING CYLINDER LOCK

Erich Mundhenke, Am Knappenberge 38, D-3252 Bad Münder 1/Hachmühlen, Fed. Rep. of Germany

Filed Nov. 13, 1989, Ser. No. 435,233
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1988, 38481; European Pat. Off., Jun. 24, 1989, 89111569.3
Int. Cl.[5] E05B 63/00
U.S. Cl. 70—1.5 13 Claims

1. A cylinder lock with a cylinder housing and, rotatably mounted therein, a cylinder plug comprising a key passage extending in its axial direction, with a lock bit coupled to the cylinder plug and rotatably mounted in the cylinder housing, there being provided in the cylinder housing and in the cylinder plug a plurality of mutually aligned bores extending at right-angles to the cylinder plug axis and into the passage and in which housing pins which are preferably of equal length and plug pins which are of different lengths are biased in the direction of the passage by spring force, there being formed between the cylinder housing and the cylinder plug a first separating joint traversed by the housing pins when the key is not inserted into the lock, the ends of the plug pins so co-operating with the locking notches of the key that when the key is inserted the pins are displaced in their axial direction into a position in which the bearing ends of all plug and housing pins are located in the first separating joint and so allow a rotation



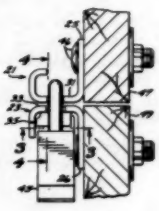
of the cylinder plug and of the lock bit, characterised in that there is in the cylinder housing (1) a displaceable barrier element (9) which locks the lock bit (5) within the cylinder housing 1 when the cylinder plug (2) is removed from the cylinder housing (1).

4,961,329

PROTECTIVE PADLOCK HASP FOR USE WITH PADLOCKS HAVING MULTIPLE LENGTH SHACKLES

John P. Anderson, Norco, Calif., assignor to The Hartwell Corporation, Placentia, Calif.

Filed Sep. 15, 1989, Ser. No. 407,966
Int. Cl.[5] E05B 67/38; E05C 19/08
U.S. Cl. 70—2 4 Claims



1. A protective padlock hasp apparatus for receipt of a range of padlocks having different length shackles and comprising;

a pair of hasp mounting plates for mounting on adjacent parts and including fastener-receiving openings;

shield plate means arranged to be spaced from said mounting plate to cooperate therewith in forming a cavity for receipt of such padlock and projecting in one direction to block access by an authorized tool to the padlock shackle adjacent the body of the padlock and in the opposite direction to block direct access to the curved intermediate portion of such shackles;

webs carried from said mounting plates and formed with respective padlock shackle receiving openings, one of said webs carrying said shield plate means; and

at least one discrete spacer device including a mounting flange configured to complementally nest over one of said hasp mounting plates, and formed with a fastener aperture complementally positioned to, when said mounting flange is nested over said mounting plate, be aligned with one of said fastener openings to receive therethrough a fastener, said spacer device further including a spacer leg configured to, when said mounting flange is nested over said mounting plate, engage the top surface of the body of a padlock received in said hasp apparatus to block movement of said body relative to said webs to thus cause such

shackle and body to cooperate in constraining said webs against separation from one another.

4,961,330

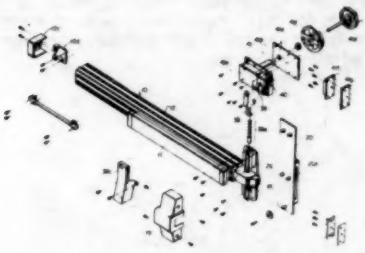
HIGH SECURITY PANIC EXIT SYSTEM

Walter R. Evans, Lancaster, Ky., assignor to Sargent & Greenleaf, Inc., Nicholasville, Ky.

Continuation of Ser. No. 406,352, Sep. 12, 1989, abandoned. This application Mar. 15, 1990, Ser. No. 496,079

Int. Cl.[5] E01C *15/02*

U.S. Cl. 292—21 **29 Claims**



1. A combined panic exit and combination lock assembly for a security area door including a door latching panic exit device and a high security combination lock intercoupled therewith wherein operation of a panic bar from within the security area concurrently retracts both the latch bolt means of the panic exit device and lock bolt means of the combination lock for egress from the security area through an associated door while retraction of the latch bolt means and of the lock bolt means from outside the door requires independent unlocking operation of both the panic exit device and combination lock, retraction of either the latch bolt means or the lock bolt means from outside being ineffective to retract the other bolt means;

comprising a panic exit device housing to be fixed on the door against an inside surface of the door, an elongated push plate forming said panic bar movable outwardly and inwardly relative to the door surface, a primary latch bolt extendable from said exit device, actuator means for the latch bolt including a main control link and a primary latch output operatively coupled therewith for retracting and projecting the primary latch bolt and a rod member movable to retract the primary latch bolt, secondary output means including a secondary output member, at least one pivoted bellcrank having an arm pivotally connected to said secondary output member to move the latter to retracted position coordinately with the primary latch bolt;

a combination lock having means operated by a combination lock dial to retract and project a secondary bolt and an associated primary lock bolt when the proper combination has been dialed, a rotatable member to retract the primary lock bolt, and linking means coupling the rotatable member with said secondary output to activate the associated bellcrank to retract the secondary latch bolt;

and an elongated coupling link substantially paralleling and located closely adjacent to the inside door surface having a first end coupling between said coupling link and said rod member and a second end coupling between said coupling link and said bellcrank, said coupling link and associated first and second end couplings including a lost motion intercoupling including means for transferring retracting movement to said secondary output from the rod member without relative lost motion to achieve concurrent retracting movement of the primary latch bolt and the primary lock bolt and for accommodating relative lost motion movement of the secondary output relative to the rod member upon retraction of the secondary output and associated primary lock bolt whereby unlocking of the combination lock retracts said primary lock bolt and secondary output linked thereto through said rotatable member without retracting said primary latch bolt.

4,961,331

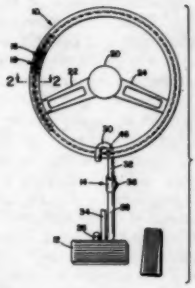
VEHICLE SECURITY SYSTEM WITH IMPROVED STEERING WHEEL

James E. Winner, 32 W. State St., Sharon, Pa. 16146

Filed Mar. 29, 1989, Ser. No. 330,051

Int. Cl.[5] B60R *25/02*; E05B *13/10*

U.S. Cl. 70—209 **6 Claims**



1. In a vehicle security system of the type which utilizes a mechanical anti-theft locking device, secured, at least in part, to the steering wheel rim of the vehicle's steering wheel, the improvement comprising:

a steering wheel and steering wheel rim including a non-metallic outer hoop containing a circular metal support ring and means for reinforcing said steering wheel against destructive severing, said reinforcing means including a steel cable embedded in said non-metallic outer hoop, said steel cable being disposed in a helical configuration wrapped around said metal support ring.

4,961,332

COMBINATION DISK LOCK COMPRISING MEANS FOR AUTOMATIC SCRAMBLING ON LOCKING

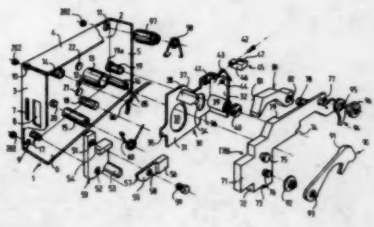
Serge Deswarte, Ault-Onival, and Etienne Decayeux, Feuquieres en Vimeu, both of France, assignors to Decayeux S.A., Feuquieres en Vimeu, France

Filed May 24, 1988, Ser. No. 197,837

Claims priority, application France, May 27, 1987, 87 07460

Int. Cl.[5] E05B *37/00*

U.S. Cl. 70—303 A **10 Claims**



1. A lock mounted on a door and comprising a bolt movable in a straight line between an extended position and a retracted position;

means for urging the bolt to its extended position;

means for pulling the bolt from its extended position to its retracted position, movably coupled to the bolt;

a combination disk comprising a notch and stop means, mounted for rotation on a shaft;

a drive disk mounted for rotation on said shaft, comprising stop means cooperating with those of the combination disk in a given relative angular position of these disks, and first means for cooperating with said traction means of the bolt;

means for rotating the drive disk;

second means for cooperating with said traction means of the bolt, adapted so as to be received in said notch in a given angular position of the combination disk obtained by actuating operating means in accordance with a coded combination, these second means being movable between a position in which they are situated outside the notch and hold the traction means of the bolt away from the drive disk and a position in which they are situated in the notch and allow cooperation between the traction means of the bolt and said first means of the drive disk, the bolt being then movable to its retracted position by rotation of the drive disk, which lock further comprises:

means adapted for locking the bolt in its retracted position, which comprise said bolt defining a stop means and a rocking lever mounted for pivoting in the lock and urged resiliently towards the bolt and stop means mounted on the rocking lever and adapted for cooperating with said stop means provided on the bolt;

means for moving said traction means of the bolt away from the drive disk when the bolt is in its retracted position;

means adapted for unlocking the bolt once the door has been opened then closed again, by cooperating with a door casing or a mobile keeper during closure of the door so as to cause the rocking lever to pivot and said stop means of the rocking lever to be moved away from the bolt; and

a door closure mechanism mounted on the door at the side of the bolt, this mechanism comprising a bar system cooperating with a casing of the door and means for operating this bar system which comprise said keeper mounted for moving in front of the bolt, the bolt passing through said keeper in its extended position so as to lock said bar system operating means, said means for unlocking the bolt being adapted for cooperating with said keeper when this latter moves at the time of closing the door for unlocking the bolt.

4,961,333

KEY LOCK WITH TRANSFER TUMBLERS AND MASTER KEYING

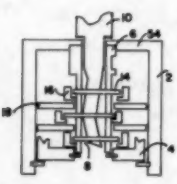
Jacob Rabinow, 6920 Selkirk Drive, Bethesda, Md. 20817

Continuation-in-part of Ser. No. 71,417, Jul. 9, 1987, Pat. No. 4,796,447. This application Jan. 5, 1989, Ser. No. 293,701

The portion of the term of this patent subsequent to Dec. 27, 2005, has been disclaimed.

Int. Cl.[5] E05B *29/02*

U.S. Cl. 70—495 **19 Claims**



1. A lock which may be opened by at least two different keys, each having a plurality of bits, comprising:

first and second members which when moved relative to each other at least a given distance enable the lock to open,

a third member having a passageway for receiving any one of said keys,

a plurality of first elements set by the key, which is in said passageway, to positions determined by the bits of such key,

a plurality of second elements respectively set by said first elements to positions determined by the bits of the key that is in said passageway; said second elements being set into different relative positions by the different keys, respectively, and

means normally preventing relative movement of said first and second members but which does not prevent such movement when said second elements are set in any one of said relative positions.

4,961,334

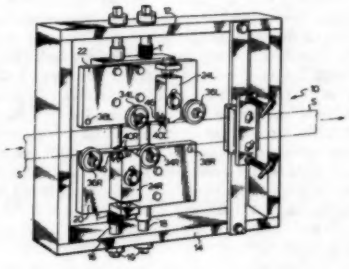
MODULAR EDGE CONDITIONER

Austen Barnes, 2250 Midland Ave. Unit 24, Scarborough, Ontario, Canada (M1P 4R9)

Filed Feb. 3, 1986, Ser. No. 825,668

Int. Cl.[5] B21F *11/00*

U.S. Cl. 72—129 **9 Claims**



1. Treatment means for metal strip edges wherein there is a strip travel direction,

a base, opposed carriages each slidably mounted on said base to be movable thereon transversely to the strip travel direction and located on opposite sides of the strip locus,

each carriage mounting a pair of rollers spaced in the strip travel direction,

said rollers being rotatable about axes perpendicular to the plane of the strip and being located to engage the same strip edge with the rollers edges shaped to position the strip,

edge treatment means mounted on each carriage designed to engage the edge of the strip intermediate, in the strip travel direction, the pair of rollers mounted on that carriage,

means on each carriage for adjustment of the edge treatment means, relative to the carriage on which it is mounted, in a direction transverse to the strip travel direction,

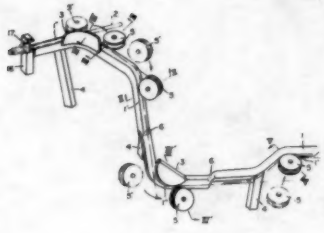
wherein said rollers and treatment means are arranged in the strip travel direction from upstream to downstream as follows : first carriage rollers, first carriage treatment means, second carriage roller, first carriage roller, second carriage treatment means, second carriage roller.

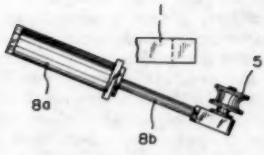
4,961,335

SMALL-DIAMETER METALLIC CONDUIT

Sadao Kimura, Numazu, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Nagasawa, Japan

Filed Apr. 20, 1989, Ser. No. 341,118
Claims priority, application Japan, Oct. 22, 1988, 63-266929; Dec. 15, 1988, 63-317428
Int. Cl.[5] B21D *7/024*
U.S. Cl. 72—381 12 Claims





1. A small-diameter metallic conduit bending machine for bending small-diameter metallic conduit into a finished curved shape, said shape of said conduit including at least first and second curves defining at least first and second bend planes respectively, said bend planes being angularly aligned to one another, said bending machine comprising:

a stationary frame which is formed by connecting bar stock or pipe stock into a shape substantially conforming to the finished curved shape of the metallic conduit over the whole length,

at least first and second bending sections provided in said stationary frame, said first bending section including an elongated first guide surface having a curvature smaller than the bend radius of the first curve of the metallic conduit in the lengthwise direction of the guide surface and being substantially orthogonal to the first bend plane of the metallic conduit in the widthwise direction, and said second bending section including a second guide surface which is substantially planar and substantially parallel to the second bend plane, said second bending section further including a guide member which is mounted to said stationary frame in a direction substantially orthogonal to said second guide surface and has a curvature smaller than the bend radius of the second curve of the metallic conduit,

a bending member which is moved by a actuator attached to said stationary frame and is selectively movable in a direction generally parallel to a selected one of said bend planes toward said stationary frame in a bending position for bending the metallic conduit to lie along a selected one of said first guide surface in said first bending section and said guide member in said second bending section, and

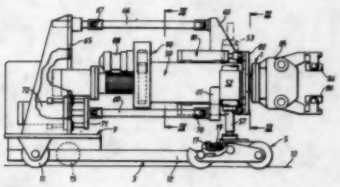
removing means for removing said bending member in a direction angularly aligned to the selected bend plane into a nonbending position away from said bending position when said bending member is to interfere with the metallic conduit which is moving as the result of the bending process at another one of said bending sections.

4,961,336

MANIPULATOR FOR METAL INGOTS

Geoffrey Wilson, and Paul E. Lister, both of Sheffield, England, assignors to Davy McKee (Sheffield) Limited, Sheffield, England

PCT No. PCT/GB88/00152, § 371 Date Nov. 2, 1988, § 102(e) Date Nov. 2, 1988, PCT Pub. No. WO88/06498, PCT Pub. Date Sep. 7, 1988
PCT Filed Mar. 2, 1988, Ser. No. 269,739
Claims priority, application United Kingdom, Mar. 3, 1987, 8704930
Int. Cl.[5] B21D *43/10*; B21J *13/10*
U.S. Cl. 72—420 7 Claims



1. A manipulator for a metal ingot comprising a peel assembly and a wheeled carriage, said peel assembly comprising an elongate shaft having at least two co-operating jaws at one end thereof, said shaft being mounted for rotation about its longitudinal axis in a housing structure; said peel assembly being supported on the carriage with the shaft extending in the direction of movement of the carriage by at least one fluid operable piston-cylinder device having one part thereof connected to the housing structure and the other part thereof engaging the carriage adjacent a first end thereof such that the housing structure can be raised and lowered by operation of the piston-cylinder device; said carriage having a rigid support means spaced from said first end; first and second elongate links positioned one on each side of the vertical plane containing the longitudinal axis of the shaft, said links being pivotally secured at their ends to the rigid support means and to the housing structure adjacent the piston-cylinder device, respectively; means for displacing said links in the direction of their length; and a third link positioned above the longitudinal axis of the shaft and pivotally secured at its ends to the rigid support means and to the housing structure adjacent the piston-cylinder device, respectively.

4,961,337

PARTS UNLOADER FOR TOP DELIVERY DIES

Thomas P. Henning, Fond du Lac, and William O. Ellis, Beaver Dam, both of Wis., assignors to Deere & Company, Moline, Ill.

Filed Sep. 8, 1989, Ser. No. 404,912
Int. Cl.[5] B21J *13/08*
U.S. Cl. 72—426 14 Claims

1. A parts unloader for use with a press having a top delivery die comprising:

a lower frame;

a support on said lower frame including a generally upright post having first and second parts slidably mounted with respect to each other for telescopic lengthening and shortening of the post;

a manually controllable power means for controlling telescopic adjustments of the post;

guide means adjustably mounted on the upper end of said post for movement about a generally horizontal axis;

means for locking said guide means in any angularly adjusted position with respect to said post;

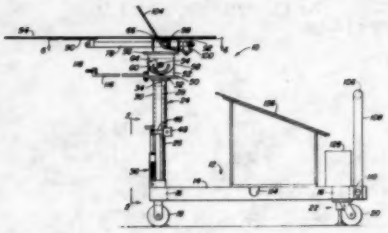
a slide frame slidably mounted on said guide means for reciprocal movement with respect thereto and at an angle

with respect to the support dependent on the angular adjustment of the guide means;

a part tray fixed to said slide frame for movement therewith and having an end extending beyond one end of the slide frame;

pulley means mounted on the guide means for rotation about an axis parallel to the generally horizontal axis; and

anchor means on an end of said slide frame opposite from said first mentioned end adapted to anchor a flexible cable;



whereby, said parts unloader is usable with different sizes of presses and when said parts unloader is positioned next to a press with a top delivery die with the first mentioned end of the slide frame positioned next to the press and a cable is trained about said pulley means and anchored to said anchor means and the ram of the press, upward movement of the press ram will cause said part tray to move under the press ram and die, and downward movement of the press ram will permit said part tray to move away from under said press ram and die.

4,961,338

VIBRATION DETECTING DEVICE

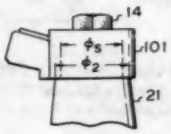
Satoshi Konurasaki, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1989, Ser. No. 312,148

Claims priority, application Japan, Feb. 26, 1988, 63-23883

Int. Cl.[5] G01L *23/22*

U.S. Cl. 73—35 **2 Claims**



1. A vibration detecting device comprising a housing for mounting on an internal combustion engine through a boss having a substantially planar contact surface for contacting the device, said housing having a center bore for receiving a bolt therethrough, said bolt being screwed into said boss to thereby secure the device to said boss, said housing including an annular space surrounding said center bore for containing a Vibration-Voltage converter consisting of a piezoelectric element and a weight adapted to impose inertial force on said piezoelectric element, and said housing having an effective contact surface which is smaller in area than said substantially planar contact surface of said boss and the whole of which is in face contact with said substantially planar contact surface of said boss when mounted such that the device exhibits a flat frequency characteristic during detection of vibrations from said engine.

4,961,339

DEVICE FOR TESTING ARTICLES OF CLOTHING FOR WATERPROOFNESS

Rudolf Kleis, and Gerd Ziegler, both of Putzbrunn, Fed. Rep. of Germany, assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Jun. 12, 1989, Ser. No. 365,150

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1988, 3826275

Int. Cl.[5] G01N *17/00, 27/06*

U.S. Cl. 73—73 **2 Claims**

1. A device for testing articles of clothing for waterproofness, which comprises a carrier adapted to support an article of clothing to be tested, said carrier having essentially the same shape as a human body, said carrier having a plurality of moisture sensors on the surface of the carrier, positioned in places where the article of clothing is prone to penetration of water, said sensors being connected to an analyzer which is activated if a moisture sensor of said sensors connected to it indicates the presence of moisture; said activation of the analyzer being caused by at least one pair of electrodes of said moisture sensor at a predetermined distance from each other which are electrically bridged by penetrated moisture, thus creating a current flow which can be evaluated by the analyzer.

4,961,340

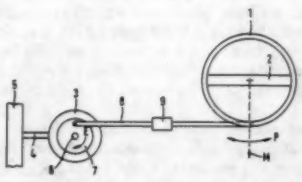
METHOD OF AND APPARATUSES FOR ELIMINATING BACKLASH INFLUENCE WHEN MEASURING OR SETTING MOTOR VEHICLE FRONT WHEEL TRACK

Peter Schrammen, Lohfelden, Fed. Rep. of Germany, assignor to WECO Industrietechnik GmbH, Kassel, Fed. Rep. of Germany

Filed Feb. 14, 1989, Ser. No. 310,155

Int. Cl.[5] G01M *19/00*

U.S. Cl. 73—118.1 **11 Claims**

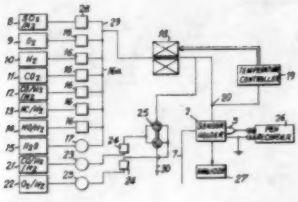


1. Method of eliminating the influence of steering backlash on the measuring or setting of the individual front wheel track on motor vehicles, characterized in that the steering wheel is set in a periodically rocking motion about a given central position during the measuring or the setting of the track, the amplitude of which motion is at least as great as half the value of the steering backlash.

4,961,341
TESTING DEVICE FOR AN OXYGEN SENSOR

Masashi Tanaka, Takatsuki; Shigekazu Yamauchi, Nagaokakyo, and Masaru Mikita, Kyoto, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1989, Ser. No. 356,440
Claims priority, application Japan, May 31, 1988, 63-131754
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—118.1 **13 Claims**



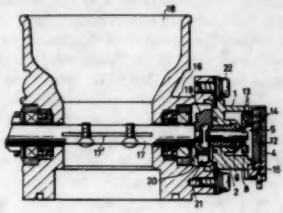
1. An oxygen sensor testing device comprising:
- a plurality of gas supply sources individually storing various specific gas constituents of exhaust gas of an internal combustion engine;
- means providing a gas passage supplied with said various specific gas constituents from said plurality of gas supply sources and capable of forming a synthetic gas corresponding to internal combustion engine exhaust gas;
- an oxygen sensor connected to said synthetic gas passage and supplied with said synthetic gas from said synthetic gas passage;
- a monitoring device for monitoring an output of said oxygen sensor; and,
- individual metering devices disposed in individual connection passages connecting said individual gas supply sources and said synthetic gas passage;
- one of said plurality of gas supply sources being a sulfur dioxide supply source to supply said synthetic gas and sulfur dioxide, and said synthetic gas being introduced into said oxygen sensor to test and evaluate said oxygen sensor.

4,961,342
APPARATUS FOR DETECTING THROTTLE VALVE OPENING OF ENGINE

Osamu Matsumoto; Mamoru Sumida, and Teruhiko Moriguchi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 138,401, Dec. 28, 1987, Pat. No. 4,866,981. This application May 31, 1989, Ser. No. 359,300
Claims priority, application Japan, Dec. 26, 1986, 61-203253; Dec. 26, 1986, 61-203254; Dec. 26, 1986, 61-203255
The portion of the term of this patent subsequent to Sep. 19, 2006, has been disclaimed.
Int. Cl.[5] G01M *19/00*
U.S. Cl. 73—118.1 **3 Claims**

1. An apparatus for detecting the opening of the throttle valve of an engine, said apparatus comprising:
- a throttle body constituting a portion of a suction passage;
- a valve shaft extending through the suction passage and mounted on the throttle body;
- a throttle valve held to the valve shaft and acting to control the amount of air flowing through the suction passage;
- a sensor for detecting the opening of the throttle valve, the sensor having a driving shaft whose one end is disposed coaxially with one end on the valve shaft, the sensor being fixed to the throttle body to produce an output corresponding to the angular position of the driving shaft; and
- an engaging means for bringing corresponding parts of the shafts into engagement with each other, said engaging means consisting of a first engaging member fixed to one of said shafts and a second engaging member fixed to the other shaft,
- wherein said first engaging member has two grooves and a cylindrical portion provided between said two grooves,

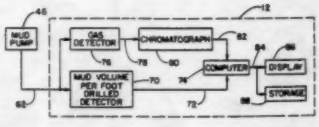


and said second engaging member is a U-shaped engaging member having two legs fitted in said two grooves in such a manner that said cylindrical portion is pinched by said two legs.

4,961,343
METHOD FOR DETERMINING PERMEABILITY IN HYDROCARBON WELLS

Daniel E. Boone, Houston, Tex., assignor to IDL, Inc., Houston, Tex.

Continuation of Ser. No. 266,258, Oct. 31, 1988, abandoned, which is a continuation of Ser. No. 37,037, Apr. 10, 1987, abandoned, which is a continuation-in-part of Ser. No. 818,024, Jan. 19, 1986, Pat. No. 4,765,182. This application Jul. 19, 1989, Ser. No. 382,900
Int. Cl.[5] E21B *49/00*
U.S. Cl. 73—152 **8 Claims**



1. A method of determining at the earth's surface the permeability of a subsurface earth formation having a known nominal hydrocarbon pore saturation value, the formation being transversed by a borehole resulting from drilling with a drill bit, comprising the steps of:
- measuring the rate of penetration of the drill bit through the subsurface earth formation,
- determining the percentage of hydrocarbon gas saturation for a preselected volume of subsurface fomation displaced by the borehole corrected to the formation pressure and temperature at a predetermined borehole depth functionally related to the measured volume of hydrocarbon gases present in the volume of drilling fluid circulated in the borehole during drilling and displacement of said preselected volume of displaced formation and expressed as a percentage of said preselected volume of displaced formation,
- determining the drilling time for the drill bit to drill a preselected increment of depth functionally related to the rate of penetration,
- measuring the viscosity of the circulated drilling fluid,
- determining the differential pressure between the hydrostatic pressure of the drilling fluid exerted on the bottom of the borehole and the pore pressure of the subsurface formation at the bottom of the borehole,
- determining an actual formation porosity value functionally related to said drilling time,

determining an actual formation pore saturation value for said preselected volume of displaced formation at a predetermined borehole depth functionally related to the measured values of hydrocarbon gas saturation and actual formation porosity,

determining the percentage of said preselected volume of displaced formation at said predetermined depth flushed by said ciculating drilling fluid functionally related to the known nominal value of the formation pore saturation and said measured actual value of the formation pore saturation,

determining the linear fluid flow rate of said circulated drilling fluid through a preselected volume of the subsurface formation displaced by the borehole at a predetermined depth and functionally related to said determined drilling fluid flush volume percentage, the rate of penetration of the drill bit and said actual measured value of formation porosity,

determining the volume of drilling fluid flowing through said preselected volume of displaced formation at said linear fluid flow rate, and

determining the permeability of the subsurface earth formation for said preselected volume of displaced formation at said predetermined depth and functionally related to the determined volume of drilling fluid flowing through said preselected volume of displaced formation, said viscosity of the drilling fluid and said differential pressure.

4,961,344

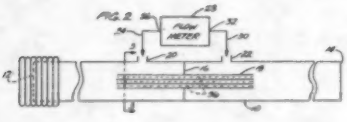
MULTIPLE TUBE FLOWMETER

Jerome A. Rodder, 775 Sunshine Dr., Los Altos, Calif. 94022

Filed May 12, 1989, Ser. No. 351,183

Int. Cl.[5] G01F *1/48, 5/00*; A01B *5/087*

U.S. Cl. 73—202 **27 Claims**



1. A gas flow measuring apparatus comprising:

a passageway having a flow path;

a first conduit in communication with the passageway;

a second conduit in communication with the passageway at a location spaced apart along the flow path from the location at which the first conduit communicates with the passageway;

an elongated hollow restriction tube within the passageway spaced inwardly from the passageway and extending substantially parallel to the axis of the passageway and extending in opposite directions beyond the locations at which the first and second conduits communicate with the passageway;

gas flow measuring means connected to the first and second conduits for measuring the flow rate of gas through the passageway; and

a plurality of elongated, smaller diameter hollow tubes within the hollow restriction tube, the smaller diameter tubes having axes of elongation substantially parallel to the axis of the restriction tube, for causing gas flow entering the passageway to flow past and through the smaller diameter tubes in the restriction tube, while producing substantially negligible resistance to gas flow therethrough to cause gas flow along the walls of the passageway to thereby produce a pressure drop at the first and second conduits sufficient for producing a measurable reading at the gas flow measuring means.

4,961,345

VIBRATION TYPE TRANSDUCER

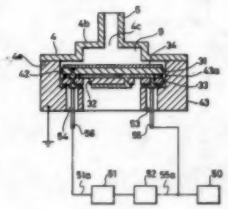
Michihiko Tsuruoka; Wataru Nakagawa; Masashi Machida, and Naohiro Kounosu, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Dec. 7, 1987, Ser. No. 129,521

Claims priority, application Japan, Dec. 8, 1986, 61-291968; Dec. 17, 1986, 61-300274; Mar. 30, 1987, 62-77264; Apr. 24, 1987, 62-101625

Int. Cl.[5] G01L *9/08*

U.S. Cl. 73—32 A **5 Claims**



1. An apparatus for detecting the resonant frequency of a vibratory member in contact with a fluid, comprising:

a housing having an interior chamber;

a vibratory member having a first and second side mounted in said housing, said vibratory member disposed in said interior chamber to define a first internal cavity an to prevent flow communication of fluid between said first side of said vibratory member to said second side;

a first fluid inlet means for introducing a fluid into said first chamber;

a vibratory controller for controlling and responding to said vibratory member; and

said vibratory member including a first fixedly held substantially planar piezoelectric device and a second substantially planar piezoelectric device secured together in planar relationship and operatively coupled to said vibratory controller so that said vibratory controller detects the resonant frequency of said vibratory member.

4,961,346

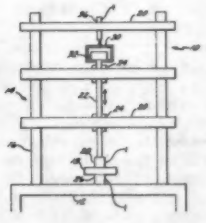
APPARATUS FOR PERFORMING ULTRASONIC MEASUREMENTS

Carlos A. Salvado, Carlsbad, and Bruce E. Wade, Del Mar, both of Calif., assignors to The Expert System Technologies, Inc., San Diego, Calif.

Continuation of Ser. No. 930,121, Nov. 12, 1986, abandoned. This application Dec. 23, 1988, Ser. No. 290,810

Int. Cl.[5] G01N *29/00*

U.S. Cl. 73—644 **2 Claims**



1. Apparatus for performing ultrasonic measurements on a solid specimen, comprising:

measurement means for introducing a first ultrasonic signal into a specimen at a first location and for receiving a

second ultrasonic signal from the specimen at a second location;

means for determining the local thickness of the specimen in a region between the first location and the second location;

compression means for forcing said measurement means against the surface of the specimen with a reproducibly controllable constant compressive force that remains constant as said measurement means moves in response to deformation of the specimen, so that the same compressive force may be applied during the entire course of a single measurement and on successive measurements, wherein said compression means includes

a frame for supporting said measurement means in contact with the surface of the specimen, and

loading means for applying a dead-weight load to said measurement means to force it against the surface of the specimen; and

control means for controlling said measurement means.

4,961,347

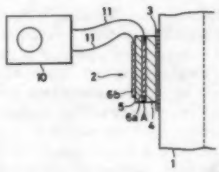
PROBE FOR ULTRASONIC FLAW DETECTORS

Takahiro Arakawa, Yokosuka; Kazuo Yoshikawa, Yokohama, and Yoshimichi Atsuta, Yokosuka, all of Japan, assignors to Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 126,335, Nov. 30, 1987. This application Sep. 15, 1989, Ser. No. 408,452

Int. Cl.[5] G01N *29/00*

U.S. Cl. 73—644 **12 Claims**



1. A probe for an ultrasonic flaw detector, comprising:

a transducer assembly having a transducer made from lithium niobate, said transducer being sandwiched between a pair of electrodes; and

an element disposed between said transducer assembly and an object to be tested for flaws;

at least one of said electrodes being an Ag-based brazing alloy, said at least one electrode being brazed so as to integrally join said transducer assembly and said element;

a bonding surface being defined on a face of said transducer facing said at least one electrode, said bonding surface having a thin film of Cu or Ni formed thereon by a surface treatment and heat treatment at 800° C. for about one hour.

4,961,348

FLOWMETER FLUID COMPOSITION CORRECTION

Ulrich Bonne, 4936 Shady Oak Rd., Hopkins, Minn. 55343

Filed Dec. 16, 1988, Ser. No. 285,897

Int. Cl.[5] G01F *1/68, 15/02*

U.S. Cl. 73—861.02 **22 Claims**

1. A method for compensating the flow measurement of a gaseous fluid of interest for changes in the composition of that fluid in a flowmeter of the microbridge class having a first dynamic microbridge exposed to the flow and producing a flow-related output signal, comprising the steps of:

obtaining an on-going, uncorrected nulled microbridge sensor output (S_o) for the fluid of interest;

obtaining an on-going, uncorrected nulled mass flow value (M_o) or volumetric flow value (V_o) for the fluid of interest in relation to the microbridge sensor output;

obtaining the specific heat (c_p) thermal conductivity (k) and density (q); and

applying a correction factor normalized with reference to a particular gas to the flowrate signal to obtain the corrected mass flow value (M_o*) or volumetric flow (V_o*) and sensor output S_o* according to a relationship selected from:

$$M_o^*/M_o=(k/k_o)^{x1}(c_pc_{po})^{x2}$$

or

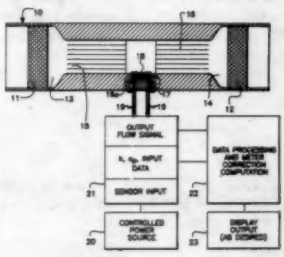
$$M_o^*/M_o=(k/k_o)^{y1}(c_pc_{po})^{y2}(q/q_o)^{y3}$$

or

$$V_o^*/V_o=(k/k_o)^{z1}(c_pc_{po})^{z2}$$

or

$$V_o^*/V_o=(k/k_o)^{z1}(c_pc_{po})^{z2}(q/q_o)^{z3}$$



and

$$S_o^*/S_o=1$$

or

$$S_o^*/S_o=(k/k_o)^{y1}(c_pc_{po})^{y2}$$

or

$$S_o^*/S_o=(k/k_o)^{z1}(c_pc_{po})^{z2}(q/q_o)^{z3}$$

Where:

M^*=corrected mass flow

S^*=corrected output (sensor)

V^*=corrected volumetric flow

k/k_o=normalized thermal conductivity

c_p/c_po =normalized specific heat

q/q_o=normalized density

o=refers to the base or reference gas

x_1, x_2, x_3, or y_1, y_2, y_3 or z_1, z_2 and z_3 are exponents.

4,961,349

FLOW METER

Steven W. Tanis, 6507 S. Adler, Tempe, Ariz. 85283

Filed Sep. 15, 1989, Ser. No. 408,076

Int. Cl.[5] G01F *1/40, 1/44*

U.S. Cl. 73—861.52 **2 Claims**

1. In combination with a conduit, the conduit including a central space through which fluid flows along the conduit, the central space having at each point along the length of the conduit a cross sectional area perpendicular to the direction of fluid flow through the conduit, and

a wall having an inner surface circumscribing the central space,

the improvement comprising means for measuring the flow of a fluid through the conduit by determining the hydraulic grade differential of fluid flowing through the conduit, said means including

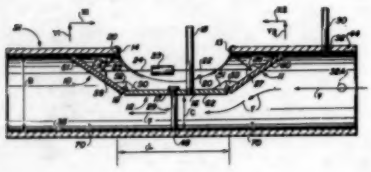
(a) at least one opening formed through the wall of the conduit;

(b) an elongate member positioned inside the conduit at a selected location along the conduit to restrict the normal flow of fluid through the conduit and including

(i) a peripheral edge shaped and dimensioned to generally sealingly continuously engage the inner surface of the conduit at points circumscribing said opening to prevent fluid from flowing intermediate the inner wall surface and said peripheral edge and out from the conduit through said opening, and

(ii) an outer surface extending from said peripheral edge outwardly away from said wall into the central space of the conduit to restrict a portion of the cross sectional area of the conduit at selected points along a portion of the length of the conduit,

the outer surface including a central planar portion shaped and dimensioned to produce laminar flow in fluid flowing through the restricted portion of the cross sectional area remaining intermediate said central planar portion and a portion of the inner surface opposing and spaced away from said central planar portion;



(c) a first aperture formed through said central planar portion and in fluid communication with said restricted portion of the cross sectional area;

(d) means connected to said first aperture to measure the pressure of laminar fluid flow intermediate said central planar portion and said opposing portion of the inner surface;

(e) a second aperture formed through the wall of the conduit in a portion of the conduit selected from the pair comprising

(i) a section of the conduit upstream from the elongate member, and

(ii) a section of the conduit downstream from said elongate member,

said upstream and downstream sections having fluid flowing through the cross sectional area of said sections of the conduit, said second aperture being in fluid communication with the central planar portion of the conduit;

(f) means connected to said second aperture to measure the pressure of fluid flowing through said portion of said conduit; and,

(g) anchor means attached to said elongate member and extending from said elongate member outwardly through said opening to an anchor point to maintain said peripheral edge of said elongate member pressed against the inner wall surface of the conduit.

4,961,350

FITTABLE PIPETTE TIP CONSISTING OF A VESSEL WHICH IS DESIGNED TO FIT A PARTICULARLY CONICAL FITTING HEAD OF A PIPETTE

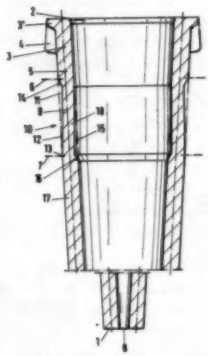
Ernst Tennstedt, Hamburg, Fed. Rep. of Germany, assignor to Firma Eppendorf-Netheler-Hinz GmbH Hamburg, Fed. Rep. of Germany

Filed Jul. 6, 1989, Ser. No. 376,377

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1988, 3824767

Int. Cl.[5] B01L *3/02*; G01N *14*

U.S. Cl. 73—864.01 **9 Claims**



1. A pipette tip, which is adapted to be fitted on a fitting head of a pipette and which constitutes a vessel having at a top end thereof a fitting top opening and at a bottom end thereof a bottom opening for receiving and dispensing a liquid, wherein said top opening is larger in diameter than said bottom opening and the pipette tip comprises a sealing portion which is adapted to contact the fitting head and which is spaced from the top end of the pipette tip and has a smooth inside surface and has a smaller wall thickness than other wall portions of the pipette tip so that said sealing portion is yieldable and adaptable, said pipette tip is formed in said sealing portion with a first recess (11, 21, 25) in the outside surface and with a second recess (15, 19, 27) in the inside surface of the wall of the pipette tip.

4,961,351

FILLABLE SAMPLE TAKING VESSEL FOR HANDLING A LIQUID SAMPLE

Hero Gerken, Hamburg, Fed. Rep. of Germany, assignor to Firma Eppendorf-Netheler-Hinz GmbH, Fed. Rep. of Germany

Filed Feb. 16, 1989, Ser. No. 311,526

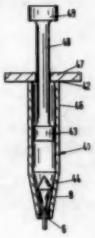
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1988, 3807704

Int. Cl.[5] G01N *1/12*

U.S. Cl. 73—864.65 **8 Claims**

1. A movable valve member for a fillable sample taking vessel for handling a liquid sample, which vessel is relatively large in diameter at one end which has a first opening which is relatively large in cross-section, the vessel having a constricted second opening at its other end and a conical portion which tapers from a point that is spaced from said first opening towards said constricted second opening, said second opening constituting an intake and discharge opening, the valve member being provided in said conical portion adjacent to the intake opening and being freely movable for sealing said vessel adjacent to said intake opening, the valve member being part of a gravity valve and having a specific gravity which is higher than that of a liquid to be handled, a substantial portion of the valve member being inserted into said vessel through said first opening and being disposed in said vessel in said conical por-

tion above said intake opening, said vessel being provided adjacent to said intake opening with a valve seat which faces said first opening and is engageable by said valve member to seal said intake opening, said valve member having a cylindrical intermediate portion and at opposite ends of said cylindrical intermediate portion, conical portions which terminate in conical tips, one of said tips constituting an actuating element, additionally the valve member comprises an enlarged intermediate seating portion formed with an additional resilient seating element.

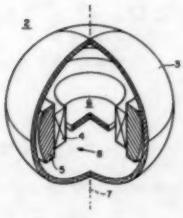


4,961,352

MAGNETIC BEARING AND SUSPENSION SYSTEM

James R. Downer, Canton; David B. Eisenhaure, Hull; Richard L. Hockney, Lynnfield, and Bruce G. Johnson, Nahant, all of Mass., assignors to SatCon Technology Corporation, Cambridge, Mass.

Filed Feb. 24, 1988, Ser. No. 159,844
Int. Cl.[5] G01C *19/08, 19/24*
U.S. Cl. 74—5.46 **25 Claims**



1. A magnetic gyroscope system comprising:

a rotor including a magnetic member having a spin axis and a flywheel fixed to said member having a spherical contour, said magnetic member including a superconducting

an armature for inducing rotation of said rotor to store angular momentum;

a generally spherical housing spaced from said rotor;

means attached to said housing for applying a magnetic field to said rotor to fix its lateral position relative to said housing;

means attached to said housing for applying a magnetic field to said rotor to fix its axial position relative to said housing;

means attached to said housing for applying a magnetic field to said rotor to adjust the angular orientation of the spin axis of the rotor relative to said housing for transferring momentum between the housing and rotor to control the relative positions of the housing and the rotor.

4,961,353

GEAR STRUCTURE

Masahiro Okada, and Hiroki Matsumoto, both of Kanagawa, Japan, assignors to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed May 1, 1989, Ser. No. 345,184
Claims priority, application Japan, Aug. 31, 1988, 63-217335
Int. Cl.[5] F16H *55/17*
U.S. Cl. 74—457 **6 Claims**

1. A gear structure comprising:

a sectoral base portion; and

an arcuate flange portion raised at generally normal angles from an arcuate periphery of said sectoral base portion and extending along said arcuate periphery, wherein said sectoral base portion and said arcuate flange portion consist of a unitary member constructed of a stamped metal plate, and

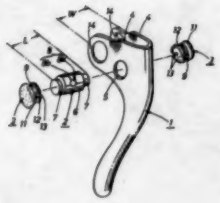
said arcuate flange portion is formed at its outer surface with forged teeth.

4,961,354

WIRE CONNECTING STRUCTURE FOR BRAKE MANIPULATING DEVICE OR OPERATING DEVICE

Toshiharu Yoshigai, Higashi-Osaka, Japan, assignor to Yoshigai Kikai Kinzoku Kabushiki Kaisha, Japan

Filed Feb. 2, 1986, Ser. No. 833,155
Claims priority, application Japan, Feb. 28, 1985, 60-28756
Int. Cl.[5] F16C *1/26*
U.S. Cl. 74—502.6 **1 Claim**



1. A bicycle brake system comprising:

a brake manipulating member or brake operating member having a pair of opposed mutually parallel walls each formed with a hole, the hole of one of the walls being aligned along a common axis with the hole on the other of the walls,

a roller-type Bowden cable connector having a trunk portion slightly smaller than each hole in diameter and a short pin portion projecting from each end of the trunk portion and received in a respective hole with an annular play space formed between the periphery of each pin portion and an internal surface defining the respective hole, the connector having an overall length equal to or slightly smaller than the width of the brake manipulating member or brake operating member as measured between exterior surfaces of said pair of walls and said trunk portion has a length that is less than the distance between interior sur-

faces of said pair of walls with a clearance space formed between said interior surfaces and end surfaces of the trunk portion, the connector having a wire engaging portion at the center of the trunk portion which engages with an inner wire of a Bowden cable, and

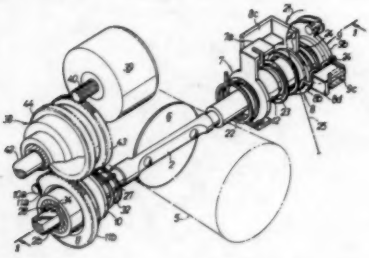
a pair of capped bushes for plugging each of the holes and covering over each short pin portion, said bushes being made of abrasion-resistant synthetic resin and each having a cylindrical body with an outer periphery of the same diameter as a respective said hole to plug the annular play space therein, an inner periphery diametrically slightly larger than the short pin portion of the connector to permit relative rotation therebetween, a flange on the outer periphery of a closed end thereof which has an outer diameter that is greater than the diameter of the respective said hole and a retaining flange extending around the outer periphery of an open end thereof which has a diameter that is greater than the diameter of the respective said hole, each of the bushes being fitted in a respective said hole of the manipulating member or operating member and having the short pin portion of the connector inserted therein to support the pin portion by the inner periphery, the distance between inner surfaces of the flanges of each bush being equal to the thickness of said wall and wherein a plurality of axial cutouts are provided in each bush that extend across the retaining flange for enabling said bush to be compressed in a manner permitting the retaining flange to pass through the annular play space into a retaining position within said clearance space.

4,961,355

THROTTLE CONTROL SYSTEM

Hiroshi Iriso, and Mitsumasa Iida, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1989, Ser. No. 378,690
Claims priority, application Japan, Jul. 14, 1988, 63-175347
Int. Cl.[5] G05G *1/14;* F02B *77/00*
U.S. Cl. 74—513 **1 Claim**



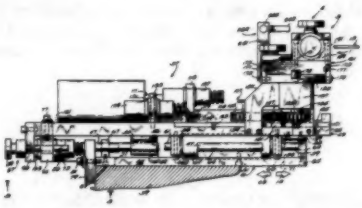
1. A throttle control system comprising a throttle valve shaft having opposite ends, a middle portion, and a throttle valve mounted at said middle portion, said shaft being rotatably carried on a support and spring-biased in a direction to close the throttle valve, an operating lever operable in response to an operation of an accelerator pedal, and a control lever operatively connected to an actuator, said levers being connected to said shaft; said system further comprising on one side of the support along an axis of the throttle shaft, a first lever fixed to the throttle shaft, and a lost motion lever carried on said shaft and being capable of engaging said first lever, the operating lever being capable of engaging said lost motion lever, both said lost motion and operating levers being disposed for rotation relative to the first lever, the relative positions of the first and the lost motion levers being established so that they are engaged with each other when the lost motion lever is rotated in the throttle valve-closing direction, the relative positions of the lost motion lever and the operating lever being established so that they are engaged with each other when the operating lever is rotated in a throttle valve-opening direction; and on the other side of the support along the axis of the throttle shaft, a second lever fixed to the throttle shaft, the control lever being rotatable relative to said second lever, said second lever and said control lever being engaged with each other so that the second lever can be relatively rotated within an extent of rotation of the throttle valve when said control lever is stationary.

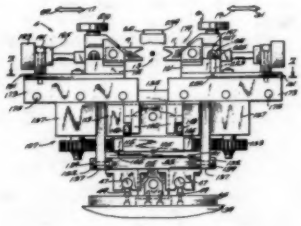
4,961,357

CONVEYOR MOUNTED PRECISION WIRE STRIPPING MACHINE

John D. Butler, Germantown, and Keith A. Johnson, Pewaukee, both of Wis., assignors to Mechtrix Corporation, Menomonee Falls, Wis.

Filed Mar. 17, 1989, Ser. No. 235,213
Int. Cl.[5] H02G *1/12*
U.S. Cl. 81—9.51 **54 Claims**





1. A machine for cutting and stripping insulated electrical conductors comprising:

a. bottom base means for supporting the machine including a bottom base;

b. base plate means supported on the bottom base for reciprocation in first directions therealong, with bearing means fastened to the bottom base for reciprocatingly supporting the base plate means thereon, and first actuator means for reciprocatingly stroking the base plate means along the bottom base in a forward direction toward the insulated electrical conductor to be cut and stripped and in a backward direction away from the insulated electrical conductor, wherein the base plate means comprises a base plate reciprocatingly supported by the bearing means fastened to the bottom base;

c. a common plate supported on the base plate means;

d. cutterhead means for opening and closing along the common plate in second directions perpendicular to the first directions;

e. second actuator means for opening and closing the cutterhead means along the common plate;

f. blade means clamped in the cutterhead means for performing selected operations on the insulated electrical conductor in accordance with the reciprocations of the base plate means and the cutterhead means; and

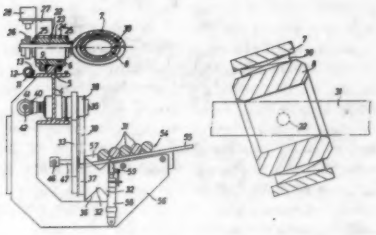
g. base plate adjustment means for setting the travel of the base plate reciprocating strokes on the bottom base in the forward direction.

4,961,358

APPARATUS FOR FEEDING ELONGATED MATERIAL

Hidemitsu Goda, 383-18, Kano, Higashi-Osaka-shi, Osaka, Japan

Filed Mar. 30, 1989, Ser. No. 330,691
Claims priority, application Japan, Oct. 18, 1988, 63-263705
Int. Cl.[5] B23B *13/10, 15/00*
U.S. Cl. 82—127 13 Claims



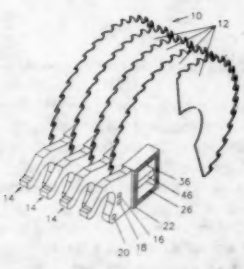
1. An apparatus for feeding a rotating elongated workpiece characterized in that the apparatus comprises a rail, a plurality of support members mounted on said rail and movable longitudinally of the rail, said support members having a support shaft extending perpendicular to the length of the rail, a housing mounted on each of the support members and being rotatable about the support shaft thereof, a contact ring mounted on the housing and rotatable about an axis perpendicular to the support shaft, said contact ring having an opening for receiving the elongated workpiece therethrough, and being rotatable about its longitudinal axis as positioned longitudinally of the rail, the axis of rotation of each contact ring being variable relative to the rotational axis of the elongated material by pivoting of the housing about the support shaft, the outer periphery of the elongated workpiece being supported by the inner periphery of each contact ring at its axial ends, and a feed mechanism for longitudinally feeding the elongated workpiece while being rotated by the contact rings.

4,961,359

SAW GUIDE WITH GAS LUBRICATION AND GAS SEALED COOLANT CHAMBER

James L. Dunham, 216 Redwood Ave., Willits, Calif. 95490

Filed Apr. 19, 1990, Ser. No. 510,982
Int. Cl.[5] B27B *5/29*
U.S. Cl. 83—169 6 Claims



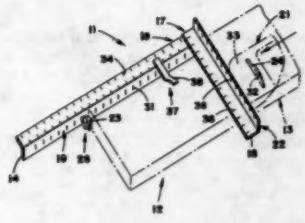
1. An improved saw guide system for use in supporting multiple saw assemblies which includes a saw guide between each adjacent saw blade and on the outside of each end blade, said improvement comprising said saw guides having a coolant chamber enclosed in a bearing surface adjacent each saw blade surface including a means integral to each saw guide for supplying and recovering liquid coolants to said cooling chamber, said coolants in said chamber directly contacting said saw blade.

4,961,360

BLOCK CUTTING GUIDE

Robert C. Peel, 210 ½ E. Lake St., Mt. Shasta, Calif. 96067, and Donald L. Troxell, 107 - 6th Ave., Dunsmuir, Calif. 96025

Filed Sep. 29, 1988, Ser. No. 250,519
Int. Cl.[5] B27B *9/04*
U.S. Cl. 83—745 7 Claims



1. A block cutting guide for facilitating the saving of a board of lumber into segments of predetermined length with a hand held saw, comprising:

a board guide member having a first flat vertical surface for abutment against the side surface of said board that is opposite from an operator of the saw, said board guide member having a vertically extending first potion that defines said first flat surface and a horizontally extending second portion that extends outward from said side surface of said board when said first portion is abutted thereagainst, said second portion being thinner than said first portion in the vertical direction and being sufficiently extensive in the outward direction to enable the fingers of one of the operator's hands to be curled around and under said second portion to grip said board guide member without contact of said fingers with the board,

a saw guide member secured to said board guide member in angled relationship thereto and having a second flat surface against which a saw may be abutted for travel therealong, the second surface being positioned to extend across said board when said first surface is abutted against said side thereof,

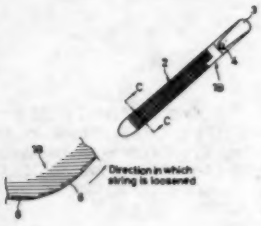
a stop member extending outward from said first surface in a position for abutment against an end of said board when said first surface is abutted against said side thereof and

means for defining a predetermined location along said board guide member at which said board guide member is to be gripped by the fingers of the operator's hand and for inhibiting inadvertent movement of said operator's hand towards said saw guide member, said location being spaced apart from said saw guide member by a distance sufficient to hold said operator's hand away from said second surface, wherein said means includes an element which extends upward from said board guide member and which is positioned to be received between the thumb and forefinger of said operator's hand.

4,961,361
TUNING PIN

Fujio Yamagishi, Iwata, and Hirohiko Miura, Hamamatsu, both of Japan, assignors to Kabushiki, Kaisha Kawa, Gakki Seisakusho, Hamamatsu, Japan

Filed Feb. 1, 1989, Ser. No. 305,426
Claims priority, application Japan, Feb. 2, 1988, 63-12894[U]
Int. Cl.[5] G10C *3/10*
U.S. Cl. 84—201 4 Claims

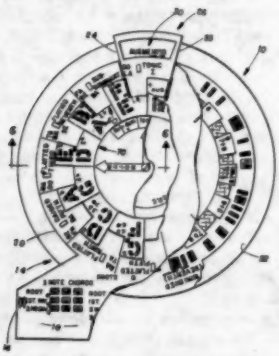


1. A tuning pin for a stringed musical instrument such as a piano, comprising a unitary nonexpandable pin with an external threaded portion having screw threads, each of said threads being provided with grooves formed in a direction substantially perpendicular to a screw winding direction of said threaded portion wherein said grooves are arranged so that the width of one groove is different from the width of another groove.

4,961,362
CHORD KEY CALCULATOR ASSEMBLY

David Gunn, 928 NE. 23 Dr., Ft. Lauderdale, Fla. 33305

Filed Jan. 19, 1989, Ser. No. 298,715
Int. Cl.[5] G09B *15/02*
U.S. Cl. 84—474 20 Claims



1. A chord and key calculator assembly for musical composition comprising:

(a) a support frame including a fixed wheel and a base portion fixedly secured to said fixed wheel and extending outwardly from a periphery thereof,

(b) window means formed said fixed wheel for viewing therethrough and disposed substantially on the periphery thereof in spaced relation to said base portion,

(c) a first plurality of indicia segments formed on an exposed face of said fixed wheel disposed continuously along the periphery thereof in cooperative relation to said window means,

(d) said first plurality of indicia segments being indicative of tonic, sub-dominant and dominant positions for chord progressions and transposing,

(e) a chord wheel rotationally secured to said frame and disposed and dimensioned to have peripheral portions thereof viewable through said window means,

(f) a second plurality of indicia segments formed on an exposed face along said peripheral portion of said chord wheel in alignable relation with said window means and being indicative of a plurality of chords,

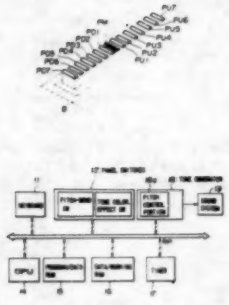
(g) a note/key wheel rotationally secured to said frame and rotatable relative thereto and to said chord wheel and including a third plurality of indicia segments formed on an exposed face along a periphery thereof and positionable in registerable alignment relative to said first plurality of indicia segments, said third plurality of indicia segments being indicative of a plurality of notes, and

(h) a major/minor wheel rotationally secured to said frame and rotatable relative thereto and to each of the other wheels, said major/minor wheel including a major indicator and a minor indicator disposed in a predetermined arcuate distance from one another along a periphery of said major/minor wheel.

4,961,363
CONTROL UNIT FOR ELECTRONIC MUSICAL INSTRUMENT

Kotaro Mizuno, and Yasuhiko Asahi, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Mar. 8, 1989, Ser. No. 321,524
Claims priority, application Japan, Mar. 8, 1988, 63-54044
Int. Cl.[5] G10H *7/00, 5/00, 1/32*
U.S. Cl. 84—615 9 Claims



1. A control unit for an electronic musical instrument, comprising:

(a) a plurality of switches each of which is assigned a corresponding predetermined value, wherein each switch is individually operable to designate a desired predetermined value as control data for controlling a musical tone;

(b) detecting means for detecting an operation state of each switch; and

(c) control means for smoothly varying a value of control data from a present value to a target value corresponding to an operated switch when said detecting means detects that any one of said switches is operated, said control means smoothly reverting said value of control data from a present value to a predetermined reference value when said detecting means detects that no switch is operated.

4,961,364

MUSICAL TONE GENERATING APPARATUS FOR SYNTHESIZING MUSICAL TONE SIGNAL BY COMBINING COMPONENT WAVE SIGNALS

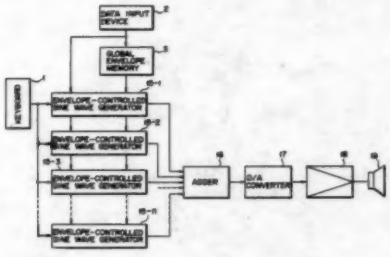
Kenichi Tsutsumi, and Jun Yoshino, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1988, Ser. No. 158,562

Claims priority, application Japan, Feb. 25, 1987, 62-40455; Feb. 25, 1987, 62-25501[U]; Feb. 25, 1987, 62-25503[U]; Feb. 25, 1987, 62-25504[U]; Feb. 25, 1987, 62-25505[U]

Int. Cl.[5] G10H *7/00, 1/02, 1/06*

U.S. Cl. 84—627 18 Claims



1. A musical tone generating apparatus for synthesizing a musical tone signal by combining a plurality of component wave signals, comprising:

Component wave generating means for generating a plurality of component wave signals;

common envelope setting means for supplying a single common envelope function for all of said plurality of component wave signals;

envelope modifying means for modifying said single common envelope function supplied from said common envelope setting means into respective envelope functions; and

envelope controlling means for controlling envelopes of said plurality of component wave signals in accordance with said respective envelope functions.

4,961,365

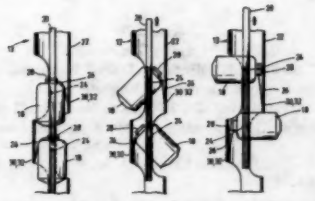
PERFORATING GUN WITH ROTATING CHARGES INCLUDING A MECHANICAL LINK RETAINING MECHANISM

Gary L. Rytlewski, League City, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Jul. 28, 1988, Ser. No. 225,330

Int. Cl.[5] E21B *43/118*

U.S. Cl. 89—1.15 10 Claims



1. A perforating gun for use in oil well boreholes, comprising:

charge means rotatable between a first stored position and a . second deployed position for detonating and perforating a formation, said charge means having pivots;

carrier tube means for enclosing said charge means;

a retaining apparatus connecting a top of said charge means to a wall of said carrier tube means, said retaining apparatus being capable of bending but being incapable of stretching by any substantial distance; and

pullrod means connected to the pivots of the charge means for placing a force on said pivots of said charge means in response to an accompanying force placed on said pullrod means,

said charge means rotating between said first stored position and said second deployed position and said retaining apparatus bending but not stretching any substantial distance when said pullrod means places said force on said pivots of said charge means.

4,961,366

ELECTROMAGNETIC LAUNCHER APPARATUS FOR REDUCING BORE RESTRIKE DURING A PROJECTILE LAUNCH

George A. Kemeny, Wilkins Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 29, 1988, Ser. No. 161,537

Int. Cl.[5] F41F *1/02*

U.S. Cl. 89—8 10 Claims

1. Electromagnetic launcher apparatus, comprising:

(A) a pair of generally parallel, electrically conducting projectile rails having a breech end and a muzzle end;

(B) first and second electrically conducting feed rails each being positioned adjacent a respective one of said projectile rails and in substantial flux linking relationship therewith;

(C) said first and second feed rails being electrically connected to a respective one of said projectile rails at only the muzzle end thereof;

(D) an armature for conducting current between said projectile rails and for accelerating a projectile along said projectile rails from said breech end to said muzzle end; and

(E) an energy source connected to said feed rails to supply a high current thereto.

4,961,367

ARRANGEMENT IN AN AMMUNITION FEEDING PATH TANKS

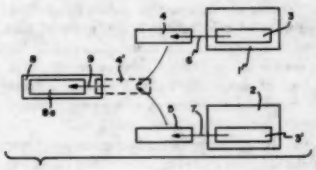
Sven Lindberg, Degerfors, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed Oct. 12, 1989, Ser. No. 420,431

Claims priority, application Sweden, Oct. 12, 1988, 8803616

Int. Cl.[5] F41A *9/37*

U.S. Cl. 89—33.04 9 Claims



1. An ammunition feeding system, comprising:

at least a first and second magazine for a first and second type of ammunition unit;

two movable members, one of said members designated for

each respective magazine, said members being alternatingly swingable between an outlet position of said respective magazine and a common feeding position;

a turntable which is turnable around an axis between a first and a second position, said turntable including a first and a second carrier unit positioned substantially in parallel with each other and on opposite sides of a center line extending in a horizontal plane of said turntable, said carrier units being mutually displaceable between feeding and idle positions;

said first carrier unit, in a first turned position of said turntable, being in said feeding position with its longitudinal axis coinciding with a feeding direction of said first type ammunition unit, said second carrier unit being in an idle position, said first type of ammunition being fed, in a horizontal position, onto said first carrier unit from said first movable member which is in said common feeding position; and

said second carrier unit, in a second turned position of said turntable which is at 180° from said first turned position in said horizontal plane, being in said feeding position with its longitudinal axis coinciding with a feeding direction of said second type ammunition unit, said second type ammunition unit being fed, in a horizontal position, onto said second carrier unit from said second movable member, which is in said common feeding position.

4,961,368

ANCHORING ELEMENT

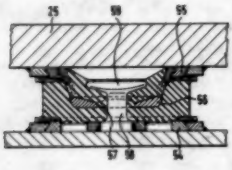
Rudolf Hartmann, Karlsbad, Fed. Rep. of Germany, assignor to IBP Pietzsch GmbH, Ettlingen, Fed. Rep. of Germany

Filed Dec. 4, 1987, Ser. No. 128,820

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1986, 3642535

Int. Cl.[5] F41H *5/04*

U.S. Cl. 89—36.02 **5 Claims**



1. An anchoring element for the securing of heavy plates on an anchoring base, particularly for securing armoring elements additional armoring to vehicles, comprising

a buffer body of a material that is elastically deformab to a limited extent, said buffer body having a plate-shaped configuration;

two connecting elements rigidly connected with said buffer body and held by said buffer body at a predetermined distance from one another so as to be movable with respect to one another within limits determined by the deformability of said buffer body, each of said connecting elements is secured to a metal sheet plate having a thickness which is very small relative to its other dimensions, said pair of metal sheet plates accommodating said buffer body between themselves and being connected with the latter over relatively large areas; and

means for securing one of said connecting elements to one of said sheet metal plates and the other one to the anchoring base;

said buffer body and said metal sheet plates which are secured to said connecting elements have at least one aperture each for improving the elastic yieldability of said buffer body due to penetration of the material of said buffer body into said metal sheet plate aperture.

4,961,369

GUN LAYING

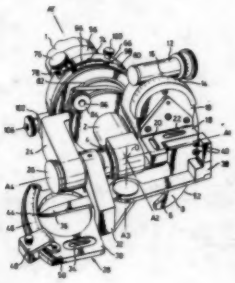
Keith R. McGill, Erith, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jan. 13, 1984, Ser. No. 573,699

Claims priority, application United Kingdom, Jan. 21, 1983, 8301653

Int. Cl.[5] F41G *3/10*

U.S. Cl. 89—41.11 **11 Claims**



1. A gun laying aid characterised in that it includes

a support member;

a bearing indicating member pivotally mounted on the support member so as to be pivotable about a first axis and having an indicator portion extended in a plane parallel to the first axis;

a reference member rotatably mounted on the support member (2) so as to be rotatable about a second axis which intersects the first axis perpendicularly at a common intersection point;

a correction indicator pivotally mounted on the reference member so as to be pivotable about a third axis which intersects the second axis at the said common intersection intersection point and is contactable with the indicator portion of the bearing indicating member;

a measuring means co-operative with the reference member and the correction indicator conjointly so as to measure their relative angular displacement about the third axis; and

level indicating means arranged to indicate when the indicator portion of the bearing indicating member and the third axis lie in vertical planes.

4,961,370

LOAD PUSHING APPARATUS

Dennis C. Sawyer, Windlesham, United Kingdom, assignor to Mantech Limited, Camberley, England

Filed Mar. 28, 1988, Ser. No. 173,101

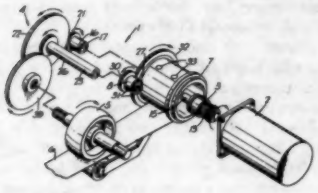
Claims priority, application United Kingdom, Mar. 30, 1987, 8707517

Int. Cl.[5] F41A *9/39*

U.S. Cl. 89—47 **11 Claims**

1. Apparatus for pushing a load, comprising: a drum; an elongate ribbon of thin resilient material attached at one end to the drum and wound therearound in a flattened state; means for unwinding the ribbon from the drum and extending it in a longitudinal direction so that an other end of the ribbon pushes the load, the ribbon having a characteristic of bending transversely into a part tubular shape as it is unwound and extended, the ribbon in the part tubular shape having a convex side and a concave side; and, deflecting means which deflects the ex-

tended ribbon between the drum and said other end of the ribbon so that in the longitudinal direction the ribbon follows



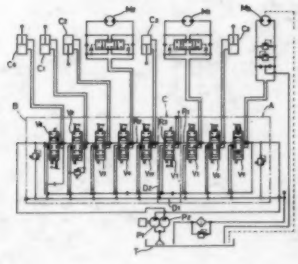
a longitudinal curve with the concave side of the ribbon on the outside of the longitudinal curve.

4,961,371

HYDRAULIC CIRCUIT FOR A BACKHOE

Akira Takashima, Sakai, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed Nov. 7, 1988, Ser. No. 267,607
Claims priority, application Japan, Nov. 10, 1987, 62-172150[U]
Int. Cl.[5] E02F *3/32*; F15B *13/09*
U.S. Cl. 91—530 **5 Claims**



3. A hydraulic circuit for a backhoe comprising:

a first multiple valve including a plurality of control valves connected in parallel to one another, each said control valve being a three-position valve having a bypass line at a neutral position thereof, the bypass lines of said control valves together forming a first center bypass line;

a second multiple valve including a plurality of further control valves connected in parallel to one another, each said further control valve being a three-positon valve having a bypass line at a neutral position thereof, the bypass lines of said control valves together forming a second center bypass line;

an attachment control valve constructed as a three-position valve, said attachment control valve including a third center bypass line having, at a neutral position thereof, a pair of opposing inlet openings connected to a return port of said attachment control valve;

a confluent feed oil line including, at opposed ends thereof, a first pump mainly for said first multiple valve and a second pump mainly for said second multiple valve so as to receive oil from said pumps;

a plurality of branch feed oil lines for connecting said confluent feed oil line to pressure ports of said control valves and said attachment control valves;

a confluent return oil line connected to return ports of said control valves and said attachment control valve for returning oil therefrom to a tank;

said first and second center bypass lines being linearly aligned with each other to be connected to said inlet openings of said third center bypass line;

said first and second center bypass lines being connected to said confluent feed oil line at the sides of said first and second pumps relative to said first and second multiple valves, so that said first and second center bypass lines receive oil from said pumps in opposing directions; and

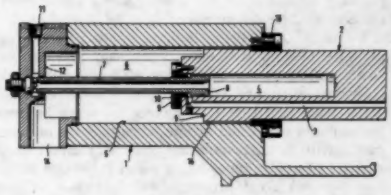
said first multiple valve, said attachment control valve and said second multiple valve being connected hydraulically parallel to and integrally with one another in the aforementioned order.

4,961,372

CLOSING MECHANISM FOR AN INJECTION MOLDING MACHINE

Heinrich Leonhartsberger, Schwertbert, Austria, assignor to Engel Maschinenbau Gesellschaft m.b.H., Schwertberg, Austria

Filed May 5, 1989, Ser. No. 348,306
Claims priority, application Austria, May 19, 1988, 1305/88
Int. Cl.[5] F01B *31/00*
U.S. Cl. 92—108 **3 Claims**



1. A closing mechanism for an injection molding machine having a piston-cylinder unit to be pressurized hydraulically and by means of which two partial strokes are carried out, a first partial stroke being run through faster than a second partial stroke, comprising:

a main cylinder having a cylinder wall defining a main cylinder chamber, and an end wall;

a piston slidable into the main cylinder chamber and having an inner cylinder chamber, the piston forming a plunger which is spaced on all sides inwardly of the cylinder wall, the piston having a piston ring disposed in the main cylinder;

a displacement tube fastened to the end wall of the main cylinder and extending axially into the main cylinder chamber and into the inner cylinder chamber, the displacement tube being open at a free end thereof spaced from the end wall and disposed in the inner cylinder chamber, a guiding cylinder connected to the free end of the displacement tube and slidably engaged in the piston and against a cylinder wall of the inner cylinder chamber;

a cover plate fixed to the piston and slidably receiving the displacement tube, the guide cylinder forming a large diameter end of the displacement tube and being retained in the inner cylinder chamber by the cover plate;

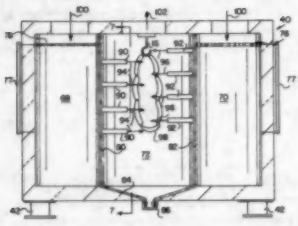
sealing means fastened to the main cylinder at a location spaced from the end wall thereof, and slidably receiving the piston to form a seal for the main cylinder chamber; and

the piston including a hydraulic conduit extending parallel to the inner cylinder chamber, the hydraulic conduit having an inner end communicating with the inner cylinder chamber at a location near the cover plate.

4,961,373
TREATMENT SYSTEM

Philip G. Milone, Burlington, Mass., assignor to Wolverine Corporation, Merrimac, Mass.

Filed Sep. 13, 1988, Ser. No. 243,905
Int. Cl.[5] A23L *3/36, 1/31*
U.S. Cl. 99—355 **16 Claims**



1. A system for thermally processing a strand of link food products that includes structure defining an elongated treatment zone,

hook type conveyor structure for supporting a strand of food product links to be thermally treated in a series of depending loops, each said depending loop containing a plurality of links, for movement along a transport path through said treatment zone,

said treatment zone being defined by two parallel spaced pressure plenum structures, each said pressure plenum structure having a vertical side wall and said hook type conveyor structure being disposed between said side walls, each said side wall having an array of generally horizontally extending nozzle tubes that are in communication with its corresponding pressure plenum structure,

said array of nozzle tubes being offset from one another so that the link food products are subjected to torquing actions by the offset flows of gas as the link products are transported through said treatment zone by said conveyor structure,

conditioning plenum structure coupled to said pressure plenum structures including heater means for heating gas and blower means for flowing gas from said conditioning plenum structure to said pressure plenum structures for flow with substantial velocity through said nozzle tubes in opposed arrays of streams for impact on loops of link food products supported on said conveyor, and

exhaust duct structure coupled to said treatment zone for flowing gas from said treatment zone for return to said conditioning plenum structure.

4,961,374
JUICER

Ming-Hsiang Lee, No. 2, Hsin-Jen Rd., Tainan City, Taiwan

Filed Mar. 14, 1990, Ser. No. 493,366
Int. Cl.[5] A23N *1/00*
U.S. Cl. 99—507 **4 Claims**

1. A juicer comprising:

a hollow support body having a front side, a top end and a bottom end;

a collecting tray held by said support body adjacent to said top end;

a cone-shaped lower bearing member provided on said collecting tray;

a rack member having a top end, a bottom end and a plurality of teeth between said top and bottom ends, said rack member vertically disposed in said hollow support body and being movable outward or inward;

a pressing member attached to said top end of said rack member and extending over said lower bearing member;

a cone-shaped upper bearing member attached to said pressing member so as to move towards and away from said lower pressing member and having a confronting conical surface relative to said lower pressing member;

a lever having a horizontal shaft member mounted to said hollow support body and a lever arm extending radially from said horizontal shaft member;

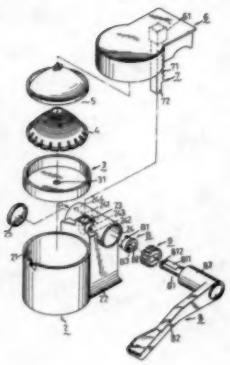
a gear mounted on said horizontal shaft member and engaged with said rack member; and

improvements which comprise:

a hollow cylindrical mounting member with a horizontal axis formed on said top end of said hollow body and having a first end and an opposite second end;

an annular partition plate fixed in said hollow cylindrical mounting member adjacent to said first end and having an inner periphery defining a central through-hole and a notch extending radially downward from said inner periphery,

said horizontal shaft member entering said hollow cylindrical mounting member through said second end and then passing through said central through-hole,



a locking sleeve member provided fixedly on said hollow cylindrical shaft member and fitted in said central through-hole, said locking sleeve member having a first radial flange and a second radial flange extending respectively on two sides of said annular partition plate, both said first and second radial flanges having terminating ends at the positions outwardly of said inner periphery of said annular partition plate, said second radial flange being capable of passing through said annular partition plate when in alignment with said notch;

said gear being mounted on said horizontal shaft member between said lever arm and said locking sleeve member;

said lever arm having a terminating end, said terminating end having a length, from said horizontal shaft member, which is longer than the length from said horizontal shaft member to said bottom end of said hollow support body, and

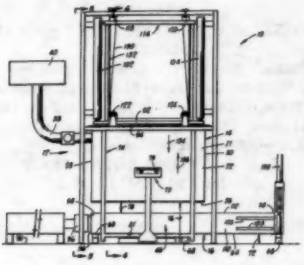
said rack member further having a longitudinal flat release face extending from said teeth to said bottom end of said rack member, said flat release face being in a plane inwardly of said teeth.

4,961,375

SYSTEM FOR BALING STRANDS OF MATERIAL AND A DENSER BALE OF STRANDS OF MATERIAL SO PRODUCED

Donald E. Weder, and Erin H. Weder, both of Highland, Ill., assignors to Highland Manufacturing and Sales Company, Highland, Ill.

Division of Ser. No. 605,386, Apr. 30, 1984, Pat. No. 4,884,682. This application Nov. 7, 1988, Ser. No. 270,779
Int. Cl.[5] B30B *15/30, 15/10, 5/00*
U.S. Cl. 100—45 7 Claims



1. An apparatus for baling strands of material comprising:

a pressing container having a first and a second end wall, an upper end wall and a lower end wall, and a material receiving space formed in a portion thereof extending generally between the first and second end walls, the material receiving space in the pressing container receiving strands of material to be baled and a portion of the pressing container generally near the second end wall being substantially enclosed, a material receiving opening being formed through a portion of the upper end wall of the pressing container in communication with the material receiving space in the pressing container, the strands of material being passable through the material receiving opening in the pressing container and into the material receiving space in the pressing container;

a horizontal pressing ram having a pressing surface formed thereon and the horizontal pressing ram being moveable through at least a portion of the material receiving space in the pressing container;

means connected to the horizontal pressing ram for moving the horizontal pressing ram from a storage position to an engaging position, the pressing surface of the horizontal pressing ram compressingly engaging the strands of material generally within the substantially enclosed portion of the pressing container for forming the strands of material into a bale of material;

a weighing container having an upper end wall and a lower end wall and a material receiving space formed in a portion thereof for receiving strands of material to be baled, a ram opening being formed through the upper wall of the weighing container, a receiving opening formed through a portion of the weighing container in communication with the material receiving space in the weighing container and a discharge opening formed through a portion of the lower end wall of the weighing container in communication with the material receiving space in the weighting container and in communication with the material receiving opening in the pressing container, the strands of material to be baled passing through the receiving opening in the weighing container and into the material receiving space in the weighing container and the strands of material to be baled passing from the material receiving space in the weighing container through the discharge opening in the weighing container for passing the strands of material to be baled from the weighing container and through the material receiving opening in the pressing container and into the material receiving space in the pressing container;

a scale assembly supporting the weighing container and providing an output indication indicating that a predetermined weight of strands of material is disposed in the material receiving space in the weighing container;

means for supporting the weighing container on the scale assembly and for supporting the weighing container generally above the pressing container with the lower end wall of the weighing container being disposed generally above and spaced a distance from the upper end wall of the pressing container, the discharge opening in the weighing container being in communication with the material receiving opening in the pressing container for passing the strands of material to be baled from the material receiving space in the weighing container through the discharge opening in the weighing container and through the material receiving opening in the pressing container into the material receiving space within the pressing container;

means for supporting the pressing container spaced a distance above a portion of the scale assembly so the pressing container is not supported on the scale assembly;

an upper pressing ram having a pressing surface formed on a portion thereof, the pressing ram being supported in the ram opening in the weighing container and substantially closing the ram opening in the weighing container in the storage position;

means for moving the upper pressing ram from a storage position to an engaging position, the pressing surface of the upper pressing ram being moved into pressing engagement with the strands of material in the material receiving space in the pressing container in the engaging position of the upper ram, the upper pressing ram being moveable to the storage position wherein the upper pressing ram is disposed within and substantially closes the ram opening in the weighing container in the storage position of the upper pressing ram and the upper pressing ram being moveable from the ram opening through a portion of the material receiving space in the weighing container through the discharge opening in the weighing container and into the material receiving opening in the pressing container as the upper pressing ram is moved from the storage to the engaging position, the upper pressing ram being disposed within and substantially closing the material receiving opening in the pressing container in the engaging position of the upper pressing ram;

a support door assembly having an opened position and a closed position, the support door assembly substantially closing the discharge opening in the weighing container in the closed position and the support door assembly being removed from the discharge opening in the weighing container in the opened position for passing the strands of material to be baled from the material receiving space in the weighing container through the discharge opening in the weighing container in the opened position of the support door assembly; and

means for moving the support door assembly from the opened position to the closed position and from the closed position to the opened position; and wherein the means for moving the upper pressing ram is defined further as moving the upper pressing ram from the storage position to the engaging position in response to an output indication of the scale assembly indicating a predetermined weight of strands of material has been disposed in the material receiving space in the weighing container; and wherein the means for moving the support door assembly is defined further as moving the support door assembly from the closed position to the opened position in response to the output indication of the scale assembly indicating a predetermined weight of

strands of material has been disposed in the material receiving space in the pressing container; and wherein the means for moving the horizontal pressing ram is defined further as moving the horizontal pressing ram from the storage position to the engaging position in response to the upper pressing ram being positioned in the engaging position, and wherein the means for moving the horizontal pressing ram is defined further as maintaining the horizontal pressing ram in the engaging position for a predetermined period of time and as moving the horizontal pressing ram from the engaging position to the storage position after the lapse of the predetermined period of time; and

means for passing strands of material into the material receiving space in the weighing container; and

means for preventing the passing of strands of material into the material receiving space of the weighing container in response to an output indication indicating a predetermined weight of strands of material has been disposed in the material receiving space in the weighing container.

4,961,376

PRINTER

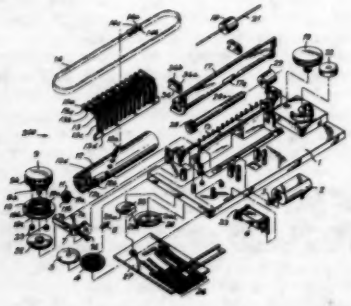
Kenji Onodera, and Masami Ohkawa, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 57,088, Jun. 2, 1987, abandoned. This application Mar. 1, 1990, Ser. No. 488,408

Claims priority, application Japan, Jun. 3, 1986, 61-128963; Jun. 4, 1986, 61-129779; Jun. 4, 1986, 61-129780; Jun. 4, 1986, 61-129781

Int. Cl.[5] B41J *1/20*

U.S. Cl. 101—93.14 **25 Claims**



1. A printer for printing on a print medium, comprising:

a type carrier in the form of an endless belt having a plurality of type elements on a side face;

hammer means for urging the type elements and the print medium, comprising:

a type carrier in the form of an endless belt having a plurality of type elements on a side face;

hammer means for urging the type elements and the print medium into contact, said hammer means having a unitary structure extending substantially parallel to a portion of the type carrier and including a hammer member for each printable position of the printer and spring means for resiliently urging the hammer member away from contact with the print medium;

print drum means for selectively driving said hammer means, said print drum means including a print drum rotatably secured at a fixed distance from said hammer means with a plurality of projections on the peripheral surface of the print drum, there being a like number of projections and hammer members, each of the projections being adapted to drivingly contact a separate hammer member whereby rotation of the print drum results in the driving contact of the hammer members by the projections; and

control means coupled to the type carrier and the print drum means for selectively advancing the endless belt relative to the hammer means and rotating the print drum and including a motor for generating the driving power for advancing the endless belt and rotating the print drum and electromagnet means for effecting the switching between advancing the endless belt and rotating the print drum; whereby selecting printing of the type elements on to the primary medium is performed.

4,961,377

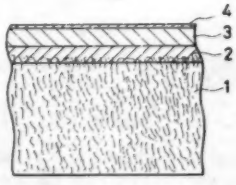
THERMAL STENCIL MASTER SHEET AND ADHESIVE THEREFOR

Masaki Bando, Tsuchiura; Kenichi Sukegawa, Inashiki; Hironiti Yamada, Tsuchiura; Mitsutsugu Masuda, Ohmiya; Yukio Okada, Ohmiya; Mitsuyoshi Yukawa, Ohmiya, and Nobuyuki Sato, Ohmiya, all of Japan, assignors to Riso Kagaku Corporation, Tokyo, Japan

Filed Jun. 2, 1987, Ser. No. 56,652

Int. Cl.[5] B05C *17/06*

U.S. Cl. 101—128.21 **4 Claims**



1. A thermal stencil master sheet for stencil printing, comprising a thermoplastic synthetic resin film that is perforatable with heat, and a porous substrate that is substantially unchanged by the heat, said film being bonded to a surface of said porous substrate with a urethane adhesive consisting essentially of a urethane prepolymer obtained by reacting a polyether diol with a diisocyanate so as to give an equivalent ratio of NCO/OH of at least 1.1

4,961,378

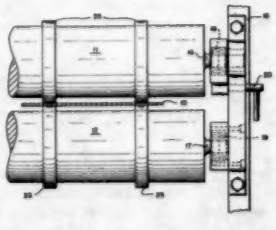
ANTI-WRAP UP DEVICE FOR WEB FED PRINTING PRESSES

Frank A. Balow, Western Springs; Edward Enstrom, Oak Park, and Eugene Skiper,Jr., Palos Hills, all of Ill., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 233,530, Aug. 18, 1988, abandoned, which is a continuation of Ser. No. 54,699, May 27, 1987, abandoned. This application Dec. 11, 1989, Ser. No. 445,948

Int. Cl.[5] B41F *7/04, 13/02;* B65H *25/00*

U.S. Cl. 101—142 **1 Claim**



1. In an offset lithographic printing press having support frame means, a printing couple comprised of a blanket cylinder

and an impression cylinder mounted on said frame means, web capturing apparatus mounted on said frame means downstream of said printing couple for protecting the printing couple from damage in the event of web breakage after it exits the printing couple, said capturing apparatus comprising:

(a) a pair of web capturing inertial rollers between which the web passes, each of said rollers having a plurality of circular web gripping rings mounted thereon for contact with the traveling web;

(b) bearing means freely rotatably supporting said rollers on said support frame means with said gripping rings in normal constant contact with the web so that the rollers are rotatably driven solely by the web;

(c) throw-out means operatively associated with the bearing means supporting one of said inertial rollers whereby said bearing means can be moved to a position at which the gripping rings of the one supported roller are not in contact with the web; and

(d) means providing adjustment of said gripping rings laterally along the axis of rotation of said inertial rollers for positioning said gripping rings in the margins between printed columns on the web.

4,961,379

OFFSET PRINTING MACHINE WITH READILY ACCESSIBLE ACCESSORY APPARATUS

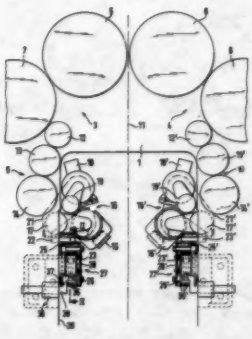
Franz X. Gollinger, Hirschbach, and Wendelin Menzinger, Dasing, both of Fed. Rep. of Germany, assignors to MAN Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed Oct. 2, 1989, Ser. No. 416,103

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1988, 3835188

Int. Cl.[5] B41F *5/04*

U.S. Cl. 101—219 **16 Claims**



1. Offset printing machine having

two side walls (1, 2) and accessory apparatus (9, 9') subject to maintenance,

wherein said accessory apparatus is positioned between said side walls in locations of impaired accessibility, said printing machine comprising

a carriage support (28) pivotably secured to at least one (2) of the side walls (1, 2) of the machine; and

a slide carriage (27) supporting at least part of said accessory apparatus movably on said carriage support, to permit moving said part of the accessory apparatus; and

wherein said carriage support (28) is positioned on said at least one side wall to permit said part of the accessory apparatus to be moved laterally outwardly of the printing machine.

4,961,380

ENERGETIC AZIDO EUTECTICS

Joseph E. Flanagan, Woodland Hills, and Dean O. Woolery, II, Reseda, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 26, 1988, Ser. No. 160,879

Int. Cl.[5] C06D *5/06*

U.S. Cl. 102—287 **7 Claims**

1. In a solid propellant composition including an oxidizer, plasticizer, polymer and fuel, the improvement comprising a low freezing point eutectic solid propellant plasticizer composition component further comprising a mixture of 1,5-dinitrato-3-nitrazapentane and 1,5-diazido-3-nitrazapentane having a eutectic freezing point below about −25° C.

4,961,381

PRIMER CENTERING DEVICE FOR LARGE DIAMETER BLASTHOLES

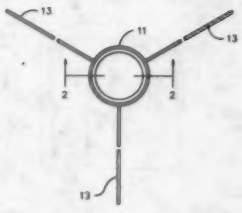
Patrick D. McLaughlin, Fort McMurray, Canada, assignor to Suncor, Inc., North York, Canada

Filed May 12, 1989, Ser. No. 350,829

Claims priority, application Canada, Sep. 29, 1988, 578771

Int. Cl.[5] F42B *3/26, 3/182*

U.S. Cl. 102—319 **7 Claims**



1. A method for reducing misfires in unlined blastholes having a diameter of about 6 to about 30 inches where an explosive charge is detonated by a primer within a casing which comprises:

(a) partially charging an unlined blasthole of said unlined blastholes with explosive powder,

(b) supporting a primer at a top of said charge of explosive powder, centering said primer in said blasthole by a centering device affixed to the casing of said primer, dissipating static charge accumulated in said blasthole by said centering device being made of a semi-conducting material having a resistance of about 10,000 ohms,

(c) completing the charge of powder in said blasthole and,

(d) detonating said charge of explosive powder.

4,961,382

PENETRATING PROJECTILE HAVING A SELF-DESTRUCTING PIERCING FRONT END

Monty W. Bai, Scottsdale; Louis P. Farace, Mesa, and John D. Titus, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 866,860, May 27, 1986, Pat. No. 4,756,254. This application Mar. 7, 1988, Ser. No. 164,612

Int. Cl.[5] F42B *12/10*

U.S. Cl. 102—476 **14 Claims**

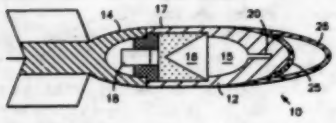
1. A penetrating projectile comprising:

a substantially cylindrical body having a piercing front end portion and a central cavity;

said front end portion including a self-destructing means; and

said self destructing means for self-destructing said piercing front end portion to create a window through which projectiles from a shaped charge within said central cavity

means are discharged after said piercing front end portion has penetrated through a wall of a target said shaped



charge having means to concentrate the force of the charge along an axis directed toward the target.

4,961,383

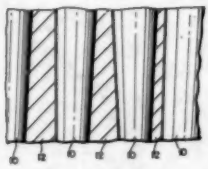
COMPOSITE TUNGSTEN-STEEL ARMOR PENETRATORS

Steven G. Fishman, Columbia; Alexander G. Rozner, Potomac; Raymond C. Wiley, Rockville, all of Md., and William N. Wishard, Dahlgren, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 26, 1981, Ser. No. 280,589

Int. Cl.[5] F42B *12/00*

U.S. Cl. 102—517 **7 Claims**



1. An armor penetrating projectile comprising:

A. a metal matrix comprising a material selected from the group consisting of steel alloys and iron wherein the matrix material has a Rockwell C hardness of from about 40 to about 60 and a density from about 99.5 to 100 percent of the theoretical density of the matrix material; and

B. heavy metal wires reinforcing the metal matrix wherein the wires are made of a heavy metal selected from the group consisting of tungsten, alloys of tungsten, molybdenum, alloys of molybdenum, tantalum, and alloys of tantalum, wherein the alloys contain at least 90 weight percent of the heavy metal, wherein the volume percentage of the heavy metal wires in the projectile is from about 25 to about 45 with the matrix material constituting the remainder; wherein the wires are cylindrical having a diameter of from 15 to 125 mils, wherein the wires run parallel to each other along the longitudinal axis of the projectile for the length of the projectile without touching each other, and wherein the wires are uniformly distributed in the projectile to provide good ballistic characteristics.

4,961,384

HYPERVELOCITY PENETRATOR FOR AN ELECTROMAGNETIC ACCELERATOR

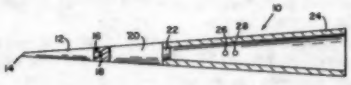
David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 18, 1986, Ser. No. 841,086

Int. Cl.[5] F42B *12/04, 12/08*; B64G *1/00*

U.S. Cl. 102—519 **3 Claims**

1. A hypervelocity penetrator for an electromagnetic accelerator comprising a cone shaped structure that includes a nosetip section that is made of an ablative composite material and having an outer tapered surface, an intermediate section that is telescoped with an secured to said nosetip section and having an outer tapered surface that is a continuation of the same taper of said outer tapered surface of said nosetip section, said intermediate section being made of a material that has a density of about 1200 lbm/ft^3, and a rear most section that is hollow and made of a material that has strength of margaring steel with a density of about 490 lbm/ft^3 and having an outer



tapered surface that is a continuation of the same taper of said outer tapered surface of said intermediate section, said rear most section being telescoped with and secured to said intermediate section, and said penetrator structure having a center of gravity which is forward of a center of pressure for the penetrator structure.

4,961,385

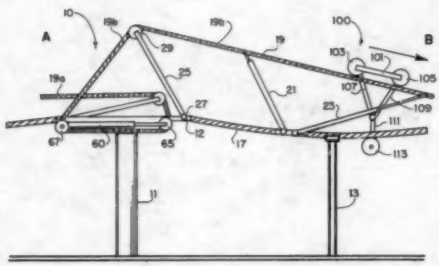
AUTOMATED TRANSPORTATION SYSTEM

Elie S. Abouzakhm, 7656 Shaughnessy Street, Suite 6, Quebec, Montreal, Canada H2A 1K4

Filed Oct. 3, 1989, Ser. No. 416,508

Int. Cl.[5] B61B *7/00*

U.S. Cl. 104—113 **31 Claims**



1. An automated transportation system, comprising:

(a) a first support defining a first station and a second support defining a second station;

(b) a flexible cable extending from said first station to said second station and beyond said second station with respect to said first station;

(c) said cable having laterally spaced sections at each station defining a transfer location;

(d) a vehicle having pulley means for supporting said vehicle on said cable;

(e) adjustment means for adjusting the angle of ascent or descent of said cable in a particular direction; and

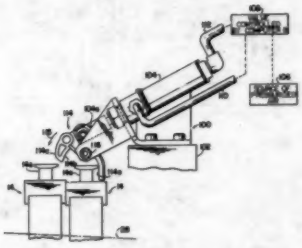
(f) said pulley means comprising first and second pulleys spaced from one another by a lateral spacing corresponding to the spacing of said laterally spaced sections of said cable whereby one of said pulleys engages said cable before said vehicle arrives at a said transfer location and the other of said pulleys is engaged with said cable at said transfer location.

4,961,386

ESCAPEMENT MECHANISM FOR GRAVITY FED TROLLEYS WITH TROLLEY ACCELERATING CAPABILITY

Richard Kuchta, Tolland, Conn., assignor to Gerber Garment Technology, Inc., Tolland, Conn.

Filed Feb. 24, 1989, Ser. No. 315,152
Int. Cl.[5] B61K 7/00
U.S. Cl. 104—250 12 Claims



9. In a trolley transport system wherein trolleys travel by gravity along an inclined rail, and wherein each trolley is held at least momentarily at a work station and then released, the improvement comprising escapement means for the trolleys released for further travel along the rail, said escapement means including fixed bracket means defining a laterally extending pivot axis oriented generally perpendicular to the direction of travel of the trolleys so released from the work station, said pivot axis located above the upper ends of the trolleys and oriented transversely with respect to said direction of trolley travel, a trolley camming bellcrank pivotally supported on said laterally extended pivot axis, said bellcrank having a stop surface for abutting a first trolley and creating a stack of trolleys on said rail upstream of the first trolley when in a first position, and said bellcrank having a trolley camming surface for propelling the first trolley downstream as a result of pivoting said bellcrank from said first position toward a second position angularly spaced from said first position, said bell crank comprising a molded plastic part having an opening between said stop surface and said trolley camming surface, a pivot pin provided in said fixed bracket and defining said laterally extended pivot axis, said pivot pin pivotably supporting said bell crank, said fluid motor having a fixed part secured to a wall in said bracket, and said fluid motor further including a moveable portion connected to said bell crank for so pivoting the bell crank between said first and second positions.

4,961,387

UNIVERSALLY ADAPTABLE, HINGED HATCH COVER SYSTEM FOR RAILROAD HOPPER CARS

Ken L. Kneebone, and James E. Head, both of R. R. 2, Neodesha, Kans. 66757

Filed Oct. 28, 1988, Ser. No. 263,706
Int. Cl.[5] B61D 39/00; E05D 7/04
U.S. Cl. 105—377 11 Claims

1. A hinging system for pivotally connecting a first body member to a second body member about a pivot axis defined by the second body member, the system comprising:

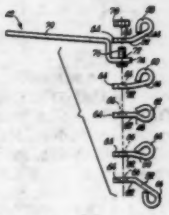
a bracket;

means for connecting the bracket to the first body member;

a plurality of hinge eye plates each including a bracket connection surface reference plane and a single eye segment defining an opening having a central axis, the central axis of each of the plurality of hinge

eye plates being displaced from the reference plane of that hinge eye plate by a distance different from the distance between the central axis and reference plane of each of the other hinge eye plates; and

means for connecting the bracket connection surface of one of the hinge plates to the bracket and for connecting the eye segment of the one hinge eye plate to the second body



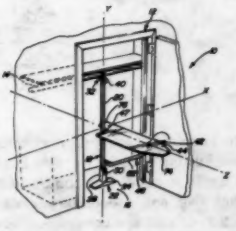
member with the central axis of the eye segment aligned with the pivot axis.

4,961,388

CLOSET IRONING TABLE

Danny Simpson, Seymour, Ind., assignor to Lear Siegler Commercial Products Corp., Seymour, Ind.

Filed Jan. 13, 1989, Ser. No. 297,092
Int. Cl.[5] A47B 23/00
U.S. Cl. 108—42 20 Claims



1. An ironing table assembly (10) for movements between a vertical stored position and a horizontal work position, said assembly (10) comprising: support means (18) for supporting said assembly (10) from a fixed structure (16) and having fore and aft sides; ironing table means (42) including a work surface (44) and a longitudinal axis through the length thereof and having a vertical position relative to said support means wherein said work surface (44) defines a vertical plane (Y-Z) extending for and aft relative to said support means and a horizontal work position wherein said work surface (44) is in a second longitudinal plane (X-Z) which is substantially perpendicular to said vertical for and aft plane; and characterized by including pivot means for interconnecting said support means (18) and said table means (42) and for pivoting said table means from said vertical position through said vertical plane while simultaneously pivoting about said longitudinal axis of said table means to said horizontal work position, said pivot means including two spaced connections between said ironing table means (42) and said support means (20), said first of said connections including a track member fixedly attached to said ironing table means (42) and guide means (50, 54) rotatably connected to said support means (20) and in sliding engagement with said track member for allowing sliding and rotational movement of said track member through said guide means as said ironing table means (42) moves through said vertical plane and rotates about said longitudinal axis, said second of said connections including an arm (62) having a first end pivotally connected to said support means (20) for pivoting movement relative to said support means (20) only in said

vertical plane (Y-Z) and a second end having a universal joint connection with said ironing table mans (42).

4,961,389

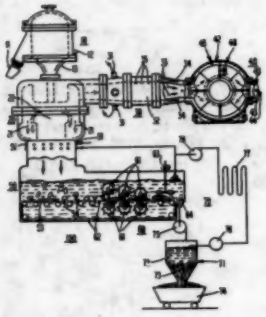
SLAG PROCESSING SYSTEM FOR DIRECT COAL-FIRED GAS TURBINES

Paul W. Pillsbury, Winter Springs, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 404,396, Sep. 8, 1989. This application Sep. 21, 1989, Ser. No. 410,400

Int. Cl.[5] F23B *7/00*

U.S. Cl. 110—233 **17 Claims**



1. In a direct coal-fired gas turbine system of the type having a primary combustion zone for burning coal in the presence of compressed air to product hot combustion gases and debris, such as molten slag, and a secondary combustion zone for the lean combustion of said hot combustion gases, said secondary combustion zone coupled to a turbine for generating electric power, the improvement comprising:

cyclone separation means for removing said debris from said hot combustion gases, said cyclone separation means disposed between said primary and secondary combustion zones and in pressurized communication therewith, said cyclone separation means comprising an integrally disposed impact separator disposed on an interior wall of said cyclone separator means for at least separating a portion of said molten slag from said hot combustion gases.

4,961,390

PERFORATED PLUGS FOR AIR HOLES IN A ROTARY COMBUSTOR

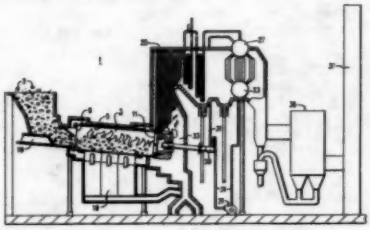
Graham A. Whitlow, Murrysville, and Suh Y. Lee, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

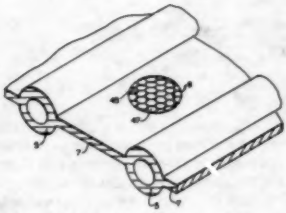
Filed Feb. 7, 1990, Ser. No. 476,215

Int. Cl.[5] A47J *36/24*; F27B *7/36*

U.S. Cl. 110—246 **12 Claims**

1. Perforated plugs for air holes in a rotary combustor in which combustion air for burning solid municipal waste is supplied through the air holes in the rotary combustor from a wind box disposed beneath the rotary combustor, said perforated plugs fitting in said holes with an interference fit and said plugs having a plurality of perforations, the perforations each having an open area in the range of 1 to 18 square millimeters, whereby said perforations cooperate with combustion air supplied to the rotary combustor through the perforated plugs in





the air holes to prevent molten aluminum, and fines from passing through the perforations and into said wind box.

4,961,391

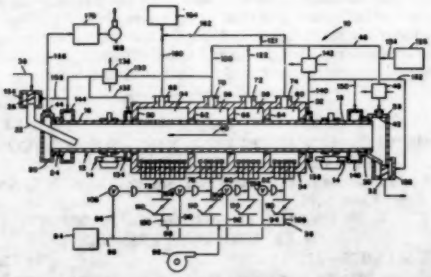
THERMAL TREATMENT PROCESS FOR ORGANICALLY CONTAMINATED MATERIAL

Kai K. Mak, Concord; Rudy G. Novak, Knoxville; Robert D. Fox, Knoxville, and Richard W. Heisen, Knoxville, all of Tenn., assignors to International Technology Corporation, Torrance, Calif.

Filed Mar. 29, 1989, Ser. No. 330,167

Int. Cl.[5] F23G *5/06*; F24B *14/00*

U.S. Cl. 110—346 **10 Claims**



1. A thermal treatment process for matrix material contaminated with organic substances employing an elongate rotary kiln having a feed end and a discharge end and a wall defining an interior space extending longitudinally therethrough from said feed end of said kiln to said discharge end of said kiln, an external surface of said kiln adjacent said interior space and separated therefrom by the wall thereof, means for rotating the kiln about its longitudinal axis with said kiln being configured to advance the matrix material through the kiln from the feed end to the discharge end as the kiln is rotated by said means for rotating, said process comprising:

employing said means for rotating to rotate the kiln about its longitudinal axis;

feeding the matrix material into the feed end of the kiln so that the material is advanced by the rotating kiln from the feed end toward the discharge end;

combusting a hydrocarbon fuel to produce high temperature combustion gases having a relatively low oxygen concentration of below about 2%;

contacting the high temperature combustion gases with the external surface of the rotating kiln so that heat is indirectly transferred to the interior space of the kiln through the wall of the kiln from the external surface thereof to thereby heat the matrix material advancing through the kiln in an indirect manner and cause components of the organic substances and water therein to be released from the material as vapor;

conducting at least a portion of the low oxygen content combustion gases into the kiln to provide a purge gas with an oxygen content below about 2% for being conducted through the kiln adjacent the advancing material to displace the vapor from adjacent the surface of the advancing material;

controlling the flow velocity of the purge gas to provide a relatively low velocity of from about 0.5 feet per second to about 10 feet per second to gently sweep the vapor from the material advancing through the kiln so as to avoid entrainment of particulate matter in the purge gas and to thereby produce an off-gas mixture containing the purge gas together with collected vapor and having a relatively low level of particulates;

maintaining air infiltration to the rotating kiln at a sufficiently low rate to avoid an increase in the level of oxygen contained in the purge gas flowing through the kiln to a level at which sufficient oxygen would exist to support combustion of organic vapors released from the materials;

removing the off-gas mixture from the kiln;

treating the off-gas mixture following the removal from the kiln to render the off-gas mixture acceptable for discharge to the atmosphere; and

discharging the material from the discharge end of the kiln substantially free of the hazardous organic substances.

4,961,392

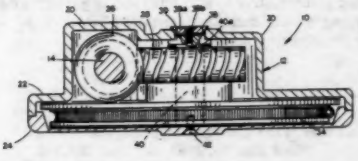
SELF-LOCKING MECHANICAL STEERING HELM

Elmer I. Ballard, Council Bluffs, Iowa, assignor to Jim Danbom and Jan Danbom, both of Milford, Iowa

Continuation-in-part of Ser. No. 89,996, Aug. 27, 1987, abandoned. This application Mar. 6, 1989, Ser. No. 319,347

Int. Cl.[5] B63H *25/10*

U.S. Cl. 114—161 **8 Claims**



1. A self-locking mechanical steering helm for a boat having a conventional push-pull flexible cable type steering system, of the type having a steering wheel adapted for connection to the helm and a steering cable within a sheath extended forwardly from a steerable drive unit for connection to the helm, the sheath being mounted between the helm and drive unit to allow longitudinal movement of the cable therein, said helm comprising,

a worm shaft housing;

a worm rotatably supported in said worm shaft housing, said worm having threads;

a worm shaft having opposite ends connected to said worm and steering wheel respectively, such that said worm and steering wheel rotate in unison;

a rotor housing for supporting a worm gear and cable sprocket;

a worm gear rotatably supported in said rotor housing in meshed relation with said worm;

a cable sprocket fixed to said worm gear for rotation in unison therewith, said sprocket being rotatably mounted in said rotor housing and adapted for receiving said steering cable in driven relation thereon;

said sheath having one end mounted to said rotor housing with said cable extending therefrom into said rotor housing;

said cable being operably connected to said steerable drive unit to steer the same in response to longitudinal movement of the cable within said sheath;

said cable being operably connected to said cable sprocket such that rotational movement of said sprocket moves the cable longitudinally within said sheath;

means for detachably connecting said worm shaft housing to said rotor housing with said worm gear in meshed relation with said worm;

said worm threads having a lead angle adapted to eliminate back drive by said worm gear; and

said worm and gear being operative to freely transmit steering torque from said steering wheel to said steerable drive unit and to substantially eliminate transmission of steering torque from said steerable drive unit to said steering wheel.

4,961,393

ANTI-PROJECTILE PROTECTION FENCE AND METHOD FOR MARINE SURFACE VESSELS

Myles N. Murray, 15 Skyline Dr., Chagrin Falls, Ohio 44022

Continuation of Ser. No. 412,763, Aug. 30, 1982, abandoned. This application Sep. 25, 1989, Ser. No. 414,616

Int. Cl.[5] B63G *8/24*; F41H *13/00*

U.S. Cl. 114—240 R **16 Claims**

1. In combination, a marine surface vessel and elongate projectile intercepting means connected to said vessel for towed transport therebehind, said elongate projectile intercepting means having a length such that said vessel can circle away from an armed attacker to a position behind a trailing portion of said elongate projectile intercepting means, said elongate projectile intercepting means including an articulated train of floating projectile intercepting barriers connected to the stern of said vessel, each floating barrier including a narrow torpedo intercepting keel extending substantially the length thereof, said keel having solid walls forming a watertight hollow interior and said keel having a draft about equal or greater than that of said vessel.

4,961,394

RESCUE OR BATHING RAFT

Karl-Heinz Fornoff, and Michael Kruska, both of Darmstadt, Fed. Rep. of Germany, assignors to Nautico Gesellschaft fur Planung und Vertrieb von Rettungs- und- Badeinseln m.b.H., Darmstadt, Fed. Rep. of Germany

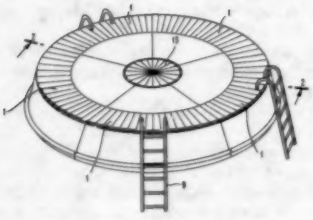
PCT No. PCT/EP87/00409, § 371 Date Jan. 31, 1989, § 102(e) Date Jan. 31, 1989, PCT Pub. No. WO88/00904, PCT Pub. Date Feb. 11, 1988

PCT Filed Jul. 29, 1987, Ser. No. 328,124

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1987, 3625886

Int. Cl.[5] B63B *35/58*

U.S. Cl. 114—266 12 Claims



1. Floating rescue or bathing raft comprising a disk annular in its horizontal projection, formed by a plurality of floating bodies with each of said bodies forming a segment of the disk, each floating body comprising a closed, foam-filled plastic shell, the floating bodies being releasably joined together at their lateral surfaces, at least one of the floating bodies carrying a ladder on its external side.

4,961,395

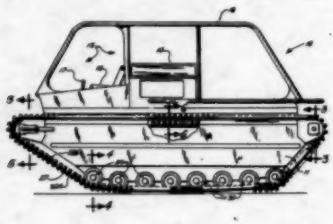
AMPHIBIOUS VEHICLE WITH IMPROVED TRACK SECUREMENT AND GUIDE MEANS

John B. Coast, Baton Rouge, La., assignor to Coast Machinery, Baton Rouge, La.

Filed Jan. 23, 1989, Ser. No. 300,620

Int. Cl.[5] B60F *3/00*

U.S. Cl. 114—270 10 Claims



1. A tracked, amphibious vehicle, comprising;

(a) at least two, spaced, elongated pontoons disposed at least generally parallel to one another each pontoon having generally flat vertical outer sidewalls;

(b) a platform structure supported by and extending between the pontoons;

(c) power means for propelling the vehicle, associated and supported at least in part by said platform;

(d) a series of longitudinally extending spaced bogie wheels for supporting said vehicle, including left and right sets of bogie wheels and mounted at the bottom area of and under each one of said pontoons and positioned along respective left and right longitudinal lines on opposite respective sides of the longitudinal centerline of each of said pontoons;

(e) a moveable, continuous, endless track assembly for each pontoon, each track encircling its pontoon in tracking engagement with its bogie wheels;

(f) the track assembly including a plurality of spaced ground engaging cleats carried by the track for providing traction for the vehicle as the endless tracks move with respect to the pontoons the cleats extending laterally to a position defined by the plane of the pontoon sidewalls;

(g) driveshaft means mounted on at least one end of each one of said pontoons and connected to said power means for driving its respective endless track;

(h) a plurality of sprockets mounted for rotation on the driveshaft means for engaging the track of each pontoon; and

(i) a track retention system for reach said pontoon comprising means including a plurality of spaced lugs carried respectively by a plurality of the spaced cleats, the plurality of lugs including lugs positioned laterally on both sides of each series of bogie wheels, and under the pontoons for transferring load between the sprockets and the track.

4,961,396

TRIM ADJUSTING DEVICE FOR JET PROPULSION BOAT

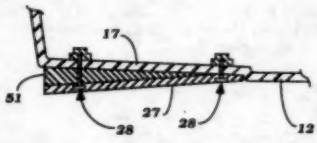
Soulchi Sasagawa, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaishi, Iwata, Japan

Filed Mar. 3, 1989, Ser. No. 318,678

Claims priority, application Japan, Mar. 4, 1988, 63-51848

Int. Cl.[5] B63B *1/18*

U.S. Cl. 114—285 10 Claims



10. A trim adjusting device for the underside of a jet propulsion boat hull comprised of a trim adjusting plate adapted to underlie the rear underside edge of said boat hull, threaded fastening means for rigidly affixing said trim adjusting plate to said hull, and adjusting means interposed between said hull and said trim adjusting plate for setting the trim angle of said trim adjusting plate relative to said hull, said angle adjusting means comprising a shim member interposed between the hull and said angle adjusting plate.

4,961,397

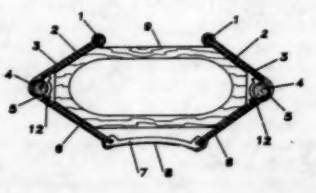
CHALLENGE CRAFT

Gordon Trone, 1153 Cozumel, Cypress, Calif. 90630

Filed Jun. 10, 1988, Ser. No. 205,375

Int. Cl.[5] B63B *7/00*

U.S. Cl. 114—347 1 Claim



1. A foldable hull for a kayak, said hull comprising a left

topside piece, a right top-side piece, a left bottom side piece, and a right bottom side piece,

Flexible fabric connectors interposed between and connecting the left bottom side piece to the left top-side piece, the right bottom side piece to the right top-side piece, and the left bottom side piece to the right bottom side piece, and wherein the fabric connectors are waterproof,

a water resistant lamnation covering the hull pieces to make the hull water resistant, removable forward and rearward wood moldings, each for supporting the left and right top-side pieces and the left and right bottom side pieces, to provide the hull with a diamond-shape in cross-section, the moldings when removed from the hull, allowing the hull to be folded,

a bottom plate on which a paddler sits, the removable forward and rearward moldings being adapted to be attached to the left and right top-side pieces and the bottom plate to secure the removable forward and rearward moldings in place,

a foam pad adapted to be positioned against the removable rear molding to provide a back rest,

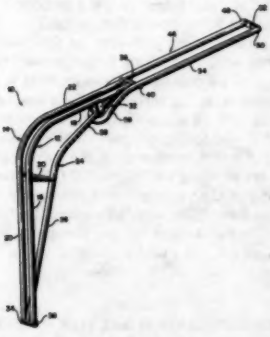
and foam elements on sides of the hull which are flexible and provide stability for the hull when in water.

4,961,398

DAVIT ASSEMBLY

Robert C. Anderson, Jr., Gloversville, and Robert O. Perry, Jr., Tribes Hill, both of N.Y., assignors to Mountain Marine, Inc., New York, N.Y.

Filed Feb. 13, 1989, Ser. No. 309,661
Int. Cl.[5] B63B *23/06*
U.S. Cl. 114—368 **24 Claims**



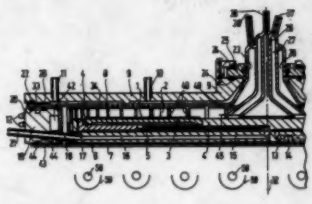
1. A davit assembly for use in supporting a vessel in either of two alternative positions, comprising a relatively stationary and generally upright frame and a vessel support arm pivotally attached to an upper end of said frame for substantially 180° pivotal movement between a first substantially horizontal upright position where a first end portion of said arm is adapted to support a vessel in a substantially horizontal use orientation, and a second substantially horizontal position where a second end portion of said arm is adapted to directly engage and support the vessel in a substantially vertical storage orientation wherein said vessel is turned substantially on its side.

4,961,399

EPITAXIAL GROWTH REACTOR PROVIDED WITH A PLANETARY SUPPORT

Peter M. Frijlink, Crosne, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 14, 1989, Ser. No. 323,468
Claims priority, application France, Mar. 22, 1988, 88 03688
Int. Cl.[5] C23C *16/00*
U.S. Cl. 118—730 **13 Claims**



1. An epitaxial growth reactor for processing wafers of semiconductor material comprising

(a) a fixed support member,

a rotating support member disposed on said fixed support member, and a plurality of disks, said rotating support member being rotatable and each of said disks supporting a semiconductor wafer, said plurality of disks being disposed on said rotating support member, and each of said plurality of disks being rotatable about individual axes through a center of each disk;

(b) a reactor vessel having a cylindrical member with a circular cross-section surrounding said fixed support member, said rotating support member, and said plurality of disks, said cylindrical member having a vertical axis, said vertical axis extending through a center of said rotating support member, said cylindrical member having a height to provide a space above said plurality of disks to circulate reactive gasses to said semiconductor wafers;

(c) a bottom plate hermetically sealed to a bottom of said cylindrical member;

(d) a cover hermetically sealed to a top of said cylindrical member, said cover being flat over a substantial portion of a periphery of said cover;

(e) a plurality of concentric funnels disposed into said cylindrical member at a center portion of said cover, said funnels being concentric about said vertical axis, and said funnels providing said reactive gasses into said cylindrical member above said semiconductor wafers; and

(f) means for uniformly mixing and distributing said reactive gasses over said semiconductor wafers in a direction of a horizontal plane.

4,961,400

ROTATING BRUSH AERATION SYSTEM

Danny K. Lapray, Buhl, Id., assignor to Clear Springs Trout Company, Buhl, Id.

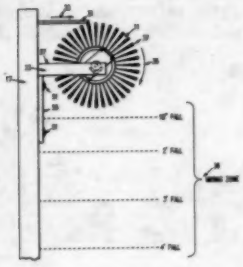
Filed Mar. 17, 1989, Ser. No. 325,523
Int. Cl.[5] A01K *63/00*; B01F *3/04*
U.S. Cl. 119—3 **14 Claims**

1. Apparatus for aerating a stream of water passing over a dam and falling into a body of water below the dam, said apparatus comprising:

an elongated, cylindrical brush; and

mounting means rigidly attached to a face of a dam near the top of said dam for rotatably mounting said cylindrical brush in front of said dam with the longitudinal axis of said cylindrical brush disposed transversely across the face of said dam, said cylindrical brush spaced outwardly from the face of said dam and positioned below the top of said dam such that the water passing over said dam falls onto

and over said cylindrical brush, said cylindrical brush responsive to the falling water for rotation thereof, said cylindrical brush mounted a predetermined height above



the surface of said body of water providing an air-water mixing zone between said cylindrical brush and the surface of said body of water.

4,961,401

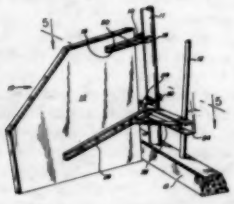
MANGER DIVIDER

John E. Hellerman, R.R. 2, Box 83, Melrose, Minn. 56352

Filed Apr. 3, 1989, Ser. No. 332,342

Int. Cl.[5] A01 *5/01*

U.S. Cl. 119—61 **9 Claims**



1. A portable manger divider easily attachable to a livestock stall frame and stanchion comprising:

a stall frame and stanchion including a vertical stall frame member;

a flat substantially rectangular divider member;

an upper mounting means, on said divider member, disposed on said vertical stall frame member;

lower mounting means on said divider member, disposed adjacent to and connected to said vertical stall frame member intermediate said lower and upper mounting means for maintaining the divider member in an upright, parallel position to the stall frame member, said lower mounting means including a horizontal stabilizer bar extending perpendicularly to the divider member and in abutment with horizontally, spaced apart stanchion members at each end whereby the divider member is securely held in position on the stall frame and stanchion intermediate adjacent livestock stalls.

4,961,402

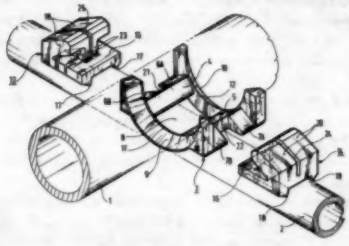
DEVICE FOR SUSPENDING A HORIZONTAL HEAT EXCHANGE TUBE ON A VERTICAL SUPPORT TUBE

Gilbert Delsol, Cernay la Ville, France, assignor to Societe Anonyme dite: STEIN INDUSTRIE, Velizy-Villacoublay, France

Filed Dec. 27, 1989, Ser. No. 457,671

Int. Cl.[5] F22B *37/24;* **F28F** *9/04*

U.S. Cl. 122—510 **6 Claims**



1. Device for suspending a horizontal heat exchange tube on a vertical support tube, wherein it comprises:

(a) an element for securing the horizontal tube, in the general form of a cradle, comprising:

(i) two symmetrical cylindrical cross-bars having an inner surface of radius of curvature slightly greater than that of the horizontal tube, and generating lines parallel to the axis of this tube, separated by an empty space, these cross-bars having on the side opposite said empty space an acute-angled wedge-shaped part; and

(ii) two connecting members for the cross-bars in an arc of a circle, each including a circular edge having a radius of curvature equal to that of the horizontal tube, in a plane perpendicular to the axis thereof, and tapering outwards on their outer side with respect to the empty spare;

said securing element being welded to the horizontal tube along the circular edges of the members;

(b) two elements for securing the vertical tube, each comprising a plane portion provided on their side facing the vertical tube with two lateral edges parallel to the axis of this tube, and an oblique portion forming a folded-over part defining with the surface of the plane part opposite the vertical tube an acute-angled recess corresponding to that of the wedge-shaped part of the cross-bars, these elements, of width smaller than that of the cross-bars of the elements securing the horizontal tube, interlocking by engagement of their recesses with the wedge-shaped parts of the cross-bars of the securing element for the horizontal tube, and being welded to the vertical tube along the lateral edges of their plane portion.

4,961,403

ENGINE GENERATOR SET FOR A VEHICLE

Toru Kawaguchi, and Masaaki Endo, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1989, Ser. No. 435,779

Claims priority, application Japan, Nov. 15, 1988, 63-288067

Int. Cl.[5] F02B *43/08*

U.S. Cl. 123—2 **7 Claims**

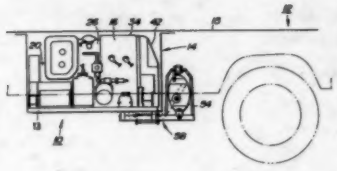
1. An engine generator set comprising:

a frame adapted to be mounted to a vehicle and having first vibration isolator means;

an engine/generator unit including an engine having an exhaust pipe and a generator driven by said engine, said unit being resiliently mounted to said frame by said first vibration isolator means;

a cover for surrounding said engine/generator unit and having an opening through which said exhaust pipe extends;

a muffler mount secured to said frame and having second vibration isolator means;



a muffler resiliently mounted to said muffler mount by said second vibration isolator means, said muffler being located externally of and in a side-by-side relation to said cover; and

a flexible pipe for connecting said exhaust pipe to said muffler.

4,961,404

INTERNAL COMBUSTION ENGINE WITH WATER-COOLING INTERCOOLER

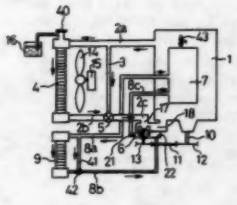
Masato Itakura, Toyota; Yoshinari Takakura, Anjo, and Toshio Tanahashi, Susono, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Feb. 20, 1990, Ser. No. 481,246

Claims priority, application Japan, Feb. 17, 1989, 64-36019; Jul. 25, 1989, 64-86491[U]; Aug. 11, 1989, 64-206687

Int. Cl.[5] F01P *1/06*

U.S. Cl. 123—41.31 **10 Claims**



1. An internal combustion engine with a water-cooling intercooler comprising:

a first fluid circuit comprising: a radiator for cooling an engine; a first bypass conduit; and a first thermostat;

a second fluid circuit comprising: a sub-radiator for cooling a water-cooling intercooler; a second bypass conduit; and a second thermostat; and

a water pump comprising: a drive shaft driven by said engine and a rotary impeller fixed at an end of said drive shaft and comprising first vanes for delivering fluid in said first fluid circuit and second vanes of capacity smaller than the capacity of said first vanes for delivering fluid in said second fluid circuit;

wherein said water pump has a clearance of labyrinth structure between said rotary impeller and a partition plate disposed around outer periphery of said rotary impeller and dividing a water pump body into a first volute chamber for delivering fluid in said first fluid circuit and a second volute chamber for delivering fluid in said second fluid circuit.

4,961,405

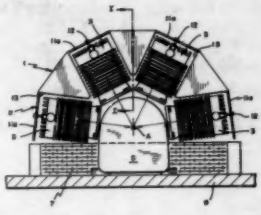
AIR SHROUD FOR CYLINDER AND CYLINDER HEAD ASSEMBLIES

Mark E. Dorsch, Chesapeake, Va., assignor to Bauer Processed Air, Inc., Norfolk, Va.

Filed Sep. 12, 1989, Ser. No. 405,981

Int. Cl.[5] F02F *1/34*

U.S. Cl. 123—41.61 **9 Claims**



1. Air shroud for cylinder and cylinder head assemblies of air-cooled compressors and engines of the type having a cooling air fan for producing an axial flow of cooling air and an array of cylinder and cylinder head assemblies arranged in the path of the axial flow and extending radially relative to the axis of said flow, said shroud comprising: a flow channel portion having a polygonal segment shape wrapping around the periphery of the array of cylinder and cylinder head assemblies and forming an air channel which extends from said cooling air fan, at a first axial edge, to a point between 50% and 90% of the distance across said cylinder head assemblies, at an opposite axial edge of the flow channel portion in an air flow direction; fastening means for attaching said flow channel portion atop each of the cylinder and cylinder head assemblies; and fins depending from said flow channel portion at said opposite axial edge; wherein each of said fins blocks an open area between adjacent cylinder and cylinder head assemblies in a manner creating an airflow orifice gap about its perimeter between the fin and the adjacent cylinder and cylinder head assemblies as a means for increasing the airflow and airflow rate of said cooling air over the cylinder and cylinder head assemblies and for creating a wrapping of said airflow around said cylinder head assemblies after said cooling air passes through said orifice gap.

4,961,406

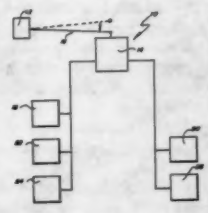
METHOD AND DEVICE FOR OPTIMIZING THE AIR-FUEL MIXTURE BURN RATE OF INTERNAL COMBUSTION ENGINES DURING LOW SPEED, LIGHT AND HEAVY LOAD OPERATING CONDITIONS

Corliss O. Burandt, Plymouth, Minn., assignor to Investment Rarities Incorporated, Minneapolis, Minn.

Filed Apr. 7, 1988, Ser. No. 178,467

Int. Cl.[5] F01L *1/34*

U.S. Cl. 123—90.15 **10 Claims**



1. A method for optimizing low speed light load and low speed heavy load operating conditions in an internal combus-

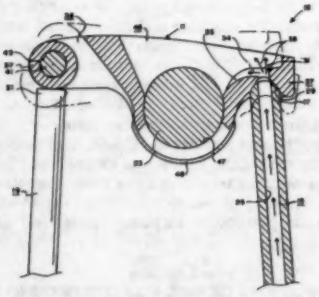
tion engine having a camshaft, a crankshaft, at least one intake valve and at least on piston, and the engine capable of providing for small valve events;, and the engine providing for earlier than normal intake valve closings, the method comprising the steps of, sensing the load demand on the engine, regulating the phasing of the operation of the camshaft of the engine with the operation of the crankshaft of the engine in response to the sensed load demand by advancing the operation of the camshaft relative to the operation of the crankshaft when a heavy load demand is sensed and by retarding the operation of the camshaft relative to the operation of the crankshaft when alight load demand is sensed, and sensing detonation int he engine and regulating the phasing operation of the camshaft relative to the operation of the crankshaft by advancing the operation of the camshaft relative to the crankshaft when detonation is sensed.

4,961,407

ROCKER ARM WITH A COST PUSH ROD SEAT

John A. McWhirter, Olive Branch, Miss., assignor to Competition Cams, Inc., Memphis, Tenn.

Filed Apr. 24, 1989, Ser. No. 342,543
Int. Cl.[5] F01L *1/18*
U.S. Cl. 123—90.41 **7 Claims**



1. A rocker arm for a rocker arm assembly of an internal combustion engine; said engine including a rocker arm support structure, a pushrod having a distal end movable between a raised position and a lowered position, and a valve stem movable between a raised position and a lowered position; said rocker arm assembly including rocker arm attachment means for pivotally attaching said rocker arm to said rocker arm support structure; said rocker arm comprising:

(a) a pushrod portion for engaging said distal end of said pushrod and for movement between a raised position and a lowered position, said pushrod portion having a pushrod seat cast thereinto for receiving said distal end of said pushrod;

(b) a valve stem portion for engaging said distal end of said valve stem for movement between a raised position and a lowered position; and

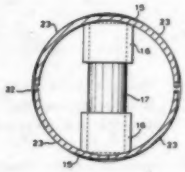
(c) an intermediate portion fixedly connecting said pushrod portion and said valve stem portion to one another for being pivotally attached to said rocker arm support structure to allow said pushrod portion and said valve stem portion to pivot between said raised and lowered positions.

4,961,408

PISTONS FOR RECIPROCATING MACHINES

Bryan N. V. Parsons, Stoney Stanton, United Kingdom, assignor to Jaguar Cars Limited, England

Filed Jul. 11, 1989, Ser. No. 378,023
Claims priority, application United Kingdom, Jul. 16, 1988, 8816981
Int. Cl.[5] F02F *3/00*
U.S. Cl. 123—193 P **12 Claims**



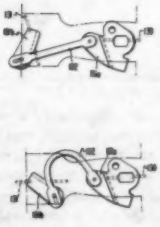
1. A piston comprising a head portion and a pair of part cylindrical skirt portions, a gudgeon pin connecting the part cylindrical skirt portions together and means being provided to locate the skirt portions axially with respect to the head portion, the skirt portions being contoured to provide high spots which will engage a cylinder bore at angularly spaced locations.

4,961,409

CONTROL APPARATUS FOR AN ENGINE

Kazuyuki Kobayashi, and Shunichi Hayashi, both of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1989, Ser. No. 363,199
Claims priority, application Japan, Jun. 29, 1988, 63-159441; Jun. 29, 1988, 63-85041[U]
Int. Cl.[5] F02D *11/02;* F02M *1/10*
U.S. Cl. 123—376 **12 Claims**



1. A control apparatus for an engine having a carburetor with a choke valve and a throttle valve, comprising

a choke lever connected to the choke valve;

a throttle lever connected to the throttle valve;

spring means for resiliently biasing the choke valve toward an open position;

interlocking means, comprising an interlocking element formed of a high molecular material having a buckling threshold which varies in dependence on the temperature of the engine, for interlocking said choke lever with said

throttle lever in such a manner that upon full opening of said throttle valve when the engine is cold, said choke lever and said throttle lever are rigidly interlocked and the choke valve is closed, and upon full opening of said throttle valve when the engine is hot, said choke lever and said throttle lever are yieldably interlocked and the choke valve is opened under the bias of said spring means; and

a speed regulating means, connected to said throttle lever, for opening and closing the throttle valve.

4,961,410

CRANK ANGLE DETECTING DEVICE FOR A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

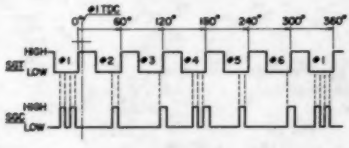
Masami Matsumura; Masahiro Hayashi, and Atsushi Ueda, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1989, Ser. No. 324,888

Claims priority, application Japan, Mar. 18, 1988, 63-63430

Int. Cl.[5] F02P *7/06*

U.S. Cl. 123—414 **11 Claims**



1. A crank angle detecting device for a multi-cylinder internal combustion engine for detecting operating states of respective cylinders having a common crankshaft comprising:

a first signal generating means for generating within two revolutions of the crankshaft a first signal including a plurality of first pulses corresponding to the number of cylinders, said first pulses being sequentially generated at predetermined crank angles of said cylinders;

a second signal generating means for generating within two revolutions of said crankshaft a second signal including a plurality of groups of second pulses, each group of second pulses having a pulse condition which corresponds to a specific period of said first signal and which is different from that of each of the other groups; and

a cylinder discriminating means electrically connected to said first and second signal generating means for discriminating the operating strokes of the respective cylinders based on said first and second signals, said cylinder discriminating means being operable to perform discrimination of the cylinders by detecting a specific pulse condition of said second signal which occurred within a specific period of said first signal.

4,961,411

FUEL CONTROL APPARATUS

Katsunori Oshiage, and Yasutoshi Nanyoshi, both of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed May 6, 1988, Ser. No. 191,132

Claims priority, application Japan, May 18, 1987, 62-74939[U]

The portion of the term of this patent subsequent to Nov. 22, 2006, has been disclaimed.

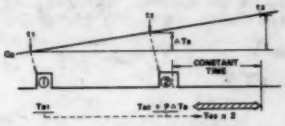
Int. Cl.[5] F02D *41/34*

U.S. Cl. 123—492 **9 Claims**

1. An apparatus for controlling an internal combustion engine having a plurality of cylinders, and fuel injectors provided for the respective cylinders, comprising:

sensor means for producing electrical signals indicative of existing engine operating conditions including engine load; and

a control unit coupled to the sensor means for operating the fuel injectors in a predetermined sequence, the control unit including means responsive to the sensor means for repetitively calculating a fuel-delivery requirement value based on the existing engine operating conditions, means for operating each of the fuel injectors to initiate first and second fuel injections for supplying fuel in an amount required in one combustion phase of the associated cylinder, the first fuel injection being initiated at a first time, the second fuel injection being initiated at a second time delayed with respect to the first time within said one combustion phase, means for determining a first fuel amount value required for the first fuel injection based on the fuel-delivery requirement value calculated just before the first time, means for calculating a difference between the fuel-delivery requirement value calculated just before the first time and the fuel-delivery requirement value calculated just before the second time, and means for determining a second fuel amount value required for the second fuel injection based on the calculated difference.



4,961,412

AIR-FUEL RATIO CONTROL SYSTEM FOR AN AUTOMOTIVE ENGINE

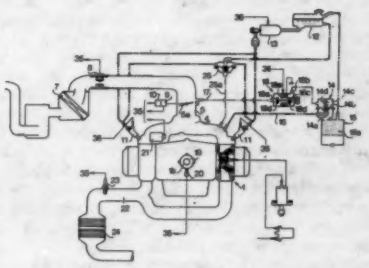
Masaaki Furuyama, Hohya, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1989, Ser. No. 395,963

Claims priority, application Japan, Aug. 31, 1988, 63-218994

Int. Cl.[5] F02M *39/00*

U.S. Cl. 123—520 **3 Claims**



1. An air-fuel ratio control system for an automotive engine, the engine having a purge system for purging fuel vapor in a canister to an intake passage of the engine, and a learning control system having a first memory storing a plurality of learning coefficients which are used for determining air-fuel ratio of a mixture and updating means for updating the learning coefficients with change of characteristics of elements of the engine, the system comprising:

first detector means for detecting a start and a stop of the purging of the fuel vapor and for producing a purge start signal and a purge cut signal respectively;

storing means responsive to the purge start signal for storing the learning coefficients stored in the first memory in a second memory as updating coefficients;

second detector means responsive to the purge start signal

for detecting a large amount of purged fuel vapor and for producing an updating signal; and

updating means responsive to the purge cut signal and to the updating signal for updating the learning coefficients in the first memory with the updating coefficients in the second memory.

4,961,413

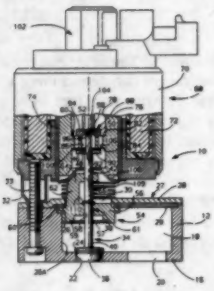
EXHAUST GAS RECIRCULATION VALVE ASSEMBLY

Thaddeus J. Grey, Rochester; Charles W. Braun, Liyonia, and Dwight O. Palmer, Rochester, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 13, 1989, Ser. No. 435,924

Int. Cl.[5] F02M *25/07*

U.S. Cl. 123—571 **11 Claims**



4. An exhaust gas recirculation valve assembly comprising:

a base having upper and lower surfaces, an exhaust chamber open to said upper surface, an inlet and an outlet port, a valve seat surrounding one of said ports, a bearing mounting recess formed in the upper surface of said base member in general alignment with said valve seat, and a bearing alignment surface formed below said recess in general alignment with said recess and said valve seat;

a cover closing said chamber having an opening extending therethrough in general alignment with said valve seat;

a valve assembly having a valve member mounted adjacent said valve seat, a valve stem with a first end from which said valve member extends, a central portion extending axially outwardly of said exhaust chamber through said opening in said cover, and a second, stepped end having a first reduced portion extending axially from said second end to terminate at a lower shoulder portion and a second reduced portion, of a diameter less than said first reduced portion, adjacent to and extending axially from said second end a distance less than said first reduced portion to terminate at an upper shoulder portion;

a one piece bearing member comprising a lower bearing portion having an aperture extending therethrough which is coaxially aligned with said valve seat and is configured to support said valve stem in a sliding relationship therewith, outwardly extending bearing positioning means formed about the perimeter of said lower bearing portion to engage said bearing mounting recess and said bearing alignment surface to maintain said bearing in alignment with said valve seat, said bearing further comprising an extension projecting outwardly from said lower bearing portion through said opening in said cover assembly, and an upper bearing portion extending from said extension in parallel, spaced relationship to said lower bearing portion, having an aperture extending therethrough which is coaxially aligned with said valve seat and is configured to support said valve stem in a sliding relationship therewith, said bearing configured to minimize axial misalignment of said valve assembly relative to said valve seat; and

an actuator coupled to said second end of said valve stem to operate said valve member into and out of engagement with said valve seat.

4,961,414

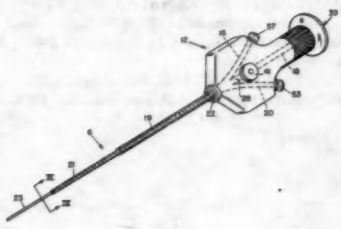
ENDOSCOPE WITH TAPERED SHAFT

George E. Cho, Sudbury, and Horace Furumoto, Wellesley, both of Mass., assignors to Candela Laser Corporation, Wayland, Mass.

Filed Feb. 6, 1989, Ser. No. 307,321

Int. Cl.[5] A61B *1/30*

U.S. Cl. 128—7 **27 Claims**



1. A rigid endoscope comprising:

a rigid shaft which is sufficiently rigid such that it is displaced through axial and rotational translation by maneuvering one end of the shaft, the rigid shaft having a plurality of stages of different outside diameter, the stages being in order of outside diameter with a smaller diameter stage being at a distal end of the shaft and a step between the first and second stages positioned in the distal third of the rigid shaft to enter and dilate a ureter.

4,961,415

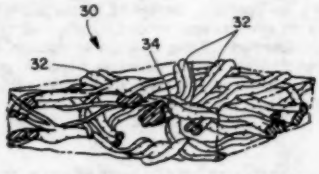
CONTROLLED DRAFT AND EFFICIENCY FILTER ELEMENT FOR SMOKING ARTICLES

Fred R. Radwanski, Norcross; Donald F. Durocher, Roswell; Leon E. Chambers, Jr., Roswell; Loyd G. Kasbo, Norcross; William F. Cartwright, Roswell; Robert G. Geer, Woodstock, and Edward P. Bullwinkel, Roswell, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jan. 16, 1987, Ser. No. 3,980

Int. Cl.[5] A24D *3/06, 3/04*

U.S. Cl. 131—332 **17 Claims**



1. Nonwoven web having a slenderness ratio value no greater than 500 for agglomerates comprising thermoplastic fibers or filaments that are present as fused agglomerates in a number fraction exceeding 33 percent and wherein a majority of fiber crossings of agglomerates are weld points.

4,961,416

KNEE BRACE

Robert Moore, and Steven Lamb, both of Hayward, Calif., assignors to Orthopedic Systems, Inc., Hayward, Calif.

Filed Jun. 12, 1989, Ser. No. 364,156

Int. Cl.[5] H61F *3/00*

U.S. Cl. 128—80 C **11 Claims**

1. a leg brace usable after ligament surgery on the knee comprising:

a. a first member including means for holding said first member to the femoral portion of the leg;
b. a second member including means for holding said second member to the tibial portion of the leg;
c. hinge means for permitting pivotal rotation of said first member relative to said second member, said hinge means being linked to said first and second members, said first and second members and said hinge means forming a unit;

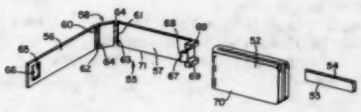
d. a bridging member extending across a selected portion of the leg, said bridging member being attached to said unit;
e. spring means for biasing said bridging member against the selected portion of the leg during a selected one part of the flexion range of the knee to prevent translation between the femoral and tibial portions of the leg, yet permitting pivotal rotation of said unit during another part of the flexion range of the knee.

4,961,417

SURGICAL DRESSING

David E. Young, Watlington, and Kenneth P. Davis, Hillington, both of England, assignors to Protectair Limited, Abingdon, England

Filed Jan. 31, 1989, Ser. No. 304,571
Claims priority, application United Kingdom, Feb. 2, 1988, 8802291
Int. Cl.[5] A61F *13/00*
U.S. Cl. 128—82 **5 Claims**



1. A surgical dressing adapted for fastening around orthopaedic fixator pins adjacent their sites of entry to and exit from the body, the dressing comprising

a pad of resilient and absorbent material adapted to be folded around one or more fixator pins in apposition to the sites of entry to and/or exit from the body and having a lower margin for body contact at such sites when said pad is so folded;

friction means along a surface of said pad for frictional engagement with one or more; fixator pins when said pad is folded round such pins; and

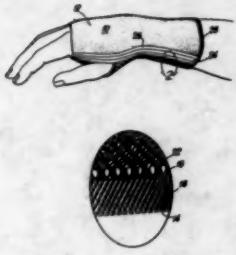
a clip adapted to be fastened around said resilient pad to clamp the pad in folded position around one or more fixator pins; said clip having a width less than that of said pad and being fastened around said pad when the same is folded with said lower margin of said pad being extended below said clip and exposed for body contact.

4,961,418

HEAT RETAINING FABRIC AND PHYSICAL THERAPY APPLIANCES

Mark McLaurin-Smith, 20/1 Carisle Close, North Ryde N.S.W., Australia (2113)

Continuation of Ser. No. 30,894, Mar. 26, 1987, abandoned. This application Jun. 5, 1989, Ser. No. 363,401
Int. Cl.[5] A61F *13/00, 15/00*
U.S. Cl. 128—157 **3 Claims**



1. A therapeutic appliance for use against a skin surface on an injured portion of a human body to provide light compression, retain body heat and stimulate the skin surface, comprising a section of composite material formed to lie against and lightly compress the body portion, the composite material comprising an insulative resilient closed-cell foam layer, an inner stretchable fabric of hydrophobic fiber with a pile surface bonded to a first side of the foam layer and an outer stretchable cover bonded to a second side of the foam layer, the inner surface being of a weft knit of seventy-five percent tri lobal nylon fiber, one hundred-fifty denier, seventy-five filament and twenty-five percent nylon fiber, seventy-eight denier, twenty filament knitted on a twenty gauge circular knit weft knitted machine with number two height sinkers.

4,961,419

MEN'S UNDERWARE WITH PENILE ENVELOPE

Alice K. Tribble, and Joe L. Tribble, both of 721 Northwest 49th, Oklahoma City, Okla. 73118

Filed Sep. 12, 1988, Ser. No. 242,681
Int. Cl.[5] A61F *5/40*
U.S. Cl. 128—159 **7 Claims**

1. Special purpose underwear briefs for accommodating a prosthetic semi-rigid penis, comprising:

a waistband of selected elastic material;

a body coverage part formed of selected light weight fabric material having rear and side panels and including leg holes;

a front plural ply retaining section included within said body coverage part and adapted to fit over said penis which consists of;

an outer front panel of elastic fabric material sewn to the front of the waistband and extending to the crotch area,

a padding panel of relatively thick fabric batting material sewn to overlay said outer front panel

an outer contact panel of soft fabric sewn to overlay said padding panel to present a smooth surface adjacent an enclosure space which receives the penis in an upright position.

a rear contact panel of soft fabric sewn to said outer contact panel to present a smooth surface to said envelope while defining the back portion of the envelope,

a rear padding panel of relative thick fabric batting material sewn to overlay said rear contact panel, and

an inner panel of soft fabric material sewn to overlay the rear padding panel.

4,961,420

GAS MASK FOR OPERATION IN CONTAMINATED AREAS

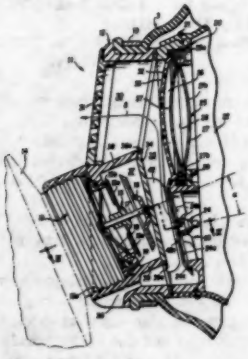
Giulio Cappa, Milan; Romano Moscatelli, Rome, and Paolo La Torre, Genzano di Roma, all of Italy, assignors to Industrie Pirelli S.p.A. and Ministero Della Difesa Direzione Generale A.M.A.T., both of, Italy

Filed Feb. 24, 1989, Ser. No. 315,469

Claims priority, application Italy, Feb. 26, 1988, 19558 A/88

Int. Cl.[5] A62B *7/10, 18/10, 18/04, 18/08*

U.S. Cl. 128—207.12 **13 Claims**



1. A gas mask for operation in contaminated areas, comprising:

a facepiece;

a nozzle tightly engaged in a lower portion of said facepiece and having a front portion facing toward an outer environment and a rear portion joined together with said front portion and having a width smaller than the width of said front portion, said nozzle including an inflow opening having a fitting adapted to hold a filter, said inflow opening being located in a lower portion of said nozzle;

a half mask situated at an interior region of said facepiece, tightly engaged with said rear portion of said nozzle and provided with a terminal edge adapted to provide a seal around the user's nose and mouth, said inflow opening communicating with said interior region of said facepiece;

connection means for enabling passage of air from said interior region of said facepiece to an interior region of said half mask;

closing valve means for opening and closing said inflow opening;

an outflow opening placing said interior region of said half mask into communication with the outer environment, said outflow opening being located in a lower part of said rear portion substantially at the level of and behind said inflow opening;

a single-acting outflow valve for opening and closing said outflow opening;

a phonic cap housed in said nozzle and situated above said inflow opening and said outflow opening;

a communication chamber positioned within said nozzle at the level of said phonic cap and including communication holes to the outer environment;

an inflow chamber which opens bilaterally in said lower portion of said facepiece near opposite sides of said rear portion and is positioned between said inflow opening and said interior region of said facepiece to enable said inflow opening to be in communication with said interior region of said facepiece;

an outflow chamber positioned between said outflow opening and said communication chamber to enable said outflow opening to be in communication with the outer environment through said communication chamber, said communication chamber being located above said inflow opening and said outflow opening; and

a partition located inside said nozzle and mutually separating said inflow chamber and said outflow chamber from each other, said partition being tightly connected with the peripheral extent of said rear partition and having a width smaller than said width of said front portion of said nozzle.

4,961,421

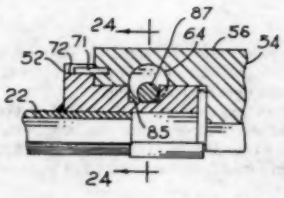
LOCKING DEVICE

George H. Muller, 1945 Gulf of Mexico Dr., Apt. 508m2, Longboat Key, Fla. 34228, assignor to Joseph J. Berke, Detroit, Mich. and George H. Muller, Longboat Key, Fla., part interest to each

Continuation-in-part of Ser. No. 422,847, Sep. 24, 1982, Pat. No. 4,791,928. This application Mar. 9, 1987, Ser. No. 23,853

Int. Cl.[5] A61B *17/32*; F16B *3/04*

U.S. Cl. 606—180 **15 Claims**



2. A locking device for releasably securing a first member to a second member comprising an opening in the first member, a plunger member secured to the second member having an outer configuration substantially the same as the inner configuration of the opening in the first member whereby a portion of the plunger member may be passed into the opening in the first

member, a slot extending transversely of the plunger member so as to extend transversely of the opening in the first member with the portion of the plunger member positioned within the opening in the first member, a pin rotatably positioned in the first member having an eccentric portion extending transversely of the opening in the first member for movement into and out of the slot in the plunger member on rotation of the pin within the first member with the plunger member positioned within the opening in the first member with the plunger member in at least one relative angular position with respect to the first member.

4,961,422

METHOD AND APPARATUS FOR VOLUMETRIC INTERSTITIAL CONDUCTIVE HYPERTHERMIA

J. Alexander Marchosky, 1501 Cerulean Dr., Creve Coeur, Mo. 63146; Christopher J. Moran, 12559 Amersham Ct., Town and Country, Mo. 63141, and Neal E. Fearnot, 832 Ashland St., West Lafayette, Ind. 47906

Continuation of Ser. No. 112,628, Oct. 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 697,697, Feb. 4, 1985, Pat. No. 4,719,919, which is a continuation of Ser. No. 459,708, Jan. 21, 1983, abandoned. This application May 2, 1988, Ser. No. 193,167

Int. Cl.[5] A61F *7/12*

U.S. Cl. 128—401 **16 Claims**

1. A method of producing volumetric, thermally conductive hyperthermia for the treatment of a cancerous tumor in a patient, comprising the steps:

determining the location and volume of the tumor with an imaging system;

interstitially implanting a plurality of heat-emitting sources in the tumor in a predetermined pattern for volumetric, thermally conductive heating of said tumor; and

controllably energizing said heat-emitting sources to produce volumetric, thermally conductive heating of said tumor and a predetermined temperature distribution in said tumor.

4,961,423

RATE ADAPTIVE MYOELECTRIC PACER

Gian C. Canducci, Bologna, Italy, assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jul. 15, 1988, Ser. No. 223,969

Int. Cl.[5] A61N *1/365*

U.S. Cl. 128—419 PG **3 Claims**

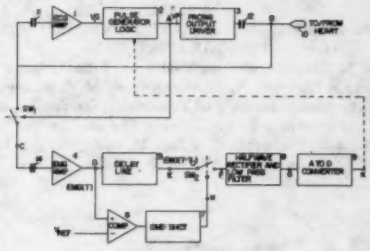
1. A cardiac pacemaker including pulse generator means for generating stimulating pulses and means for applying said stimulating pulses to the heart of a patient, comprising:

sensor means responsive to electrical activity of the heart and other muscles for producing a first EMG signal comprising myoelectric signals originating in the heart as well as myoelectric signals originating in other muscles;

signal processing means coupled to said sensor means for automatically identifying the occurrence of said myoelectric signals originating in the heart;

delay means coupled to said sensor means for providing a second EMG signal, delayed by a first predetermined time interval from said first EMG signal;

rate control means responsible to said second EMG signals



for varying the rate of pulses generated by said pulse generator means as a function of said second EMG signal; and

switch means for preventing said delayed EMG signal from affecting said rate control means for a second predetermined time interval following the automatic identification of one of said myoelectric signals originating in the heart, said second time interval being sufficient in duration to allow said one of said myoelectric signals originating in the heart, as delayed by said delay means, to subside prior to the expiration of said second time interval.

4,961,424

ULTRASONIC TREATMENT DEVICE

Tatsuya Kubota, Tokyo; Masakazu Gotanda, Sagamihara; Shinji Hatta, Tokyo; Hitoshi Karasawa, Tokyo; Tetsumaru Kubota, Tokyo; Takeaki Nakamura, Tokyo; Syuichi Takayama, Tokyo, and Hiroshi Sasaki, Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 27, 1988, Ser. No. 225,030

Claims priority, application Japan, Aug. 5, 1987, 62-194298; Aug. 5, 1987, 62-194303; Aug. 7, 1987, 62-197806; Aug. 13, 1987, 62-200941; Aug. 13, 1987, 62-200942

Int. Cl.[5] G01N *29/00*

U.S. Cl. 128—24 A **2 Claims**

1. An ultrasonic treatment device, comprising:

an ultrasonic vibration generator;

amplifier means, connected to said ultrasonic vibration generator, for amplifying ultrasonic vibrations generated by said ultrasonic vibration generator; and

vibration transmitting means, having an elongated portion and connected to said amplifier means, for transmitting the ultrasonic vibrations;

said ultrasonic vibration generator including means for gen-

erating ultrasonic vibrations in the longitudinal axial direction and in a substantially lateral direction of the elongated portion of said transmitting means comprised of (a) a piezoelectric element, (b) both end faces of said piezoelectric element having an electrode attached thereto, said electrode comprising a plurality of electrode pieces, and (c) voltage supply means for applying voltages of different levels, respectively, to the electrode pieces.

4,961,425

MORPHOMETRIC ANALYSIS OF ANATOMICAL TOMOGRAPHIC DATA

David N. Kennedy, Boston; Pauline A. Filipek, Brighton, and Verne S. Caviness, Jr., Charlestown, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 85,576, Aug. 14, 1987, abandoned. This application Sep. 25, 1987, Ser. No. 100,996

Int. Cl.[5] A61B *5/103*

U.S. Cl. 128—653 **20 Claims**

1. A system for morphometric analysis of anatomical tomographic data comprising:

determination means for processing tomographic data to determine automatically an outline of a selected anatomical feature from a selected pixel intensity contour;

said determination means including interpolating means for determining the location of said ouline in regions in which said selected intensity does not occur at any pixel, by assigning said outline to pixels having intensities closest to said selected intensity; and

morphometric processing means for processing said outline to make automatically a quantitative determination of a morphometric parameter associated with said anatomical feature.

4,961,426

METHOD FOR RETROSPECTIVELY GATING NMR DATA

Thomas A. Spraggins, Vienna, Va., and Steven F. Owens, Pearl River, N.Y., assignors to Siemens Medical Systems, Inc., Iselin, N.J.

Filed Aug. 19, 1988, Ser. No. 234,229

Int. Cl.[5] A61B *5/055*

U.S. Cl. 128—653 A **10 Claims**

1. A method for retrospectively gating NMR data in accordance with body motion of a living patient, comprising the following steps:

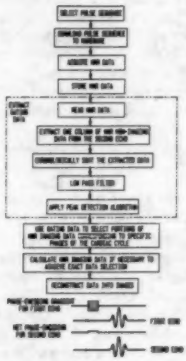
acquiring NMR imaging data using a variable phase-encoding gradient;

acquiring NMR non-imaging data using a constant phase-encoding gradient;

deriving motion data from said NMR non-imaging data;

extracting gating data from said motion data;

selecting, from said imaging data and in accordance with said gating data, gated image data which relates to at least one specific part of the body motion of interest; and



using said gated image data to produce a reconstructed NMR image.

4,961,427

ULTRASONIC DOPPLER DIAGNOSTIC APPARATUS

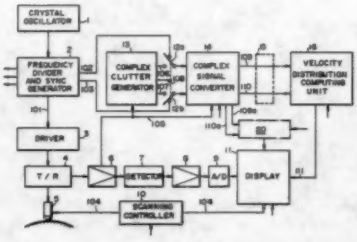
Kouroku Namekawa, deceased, late of Hoya, by Tsuneko Namekawa, heiress, and Naoki Namekawa, heir, Ōomiya, all of Japan, assignors to Aloka Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1988, Ser. No. 261,783

Claims priority, application Japan, Oct. 23, 1987, 62-269012

Int. Cl.[5] A61B *8/00*

U.S. Cl. 128—661.09 **11 Claims**



1. An ultrasonic Doppler diagnostic apparatus for detecting the distance to and velocity of a moving reflective member within a subject, comprising:

(a) means for transmitting, into the subject, an ultrasonic pulsed wave of a given constant pulse repetition frequency and for receiving the reflected echo;

(b) a complex signal converter for converting the received signal into a complex signal by mixing with a complex reference signal;

(c) a complex clutter generating means for converting a clutter signal contained in the received signal into a complex clutter signal used as a complex reference signal, said complex clutter generating means being adapted to double the clutter signal frequency and to divide the doubled clutter signal frequency into one-half frequency to obtain two complex clutter signals different in phase by 90 degrees; and

(d) means for determining the distance to and velocity of said moving reflective member within said subject from

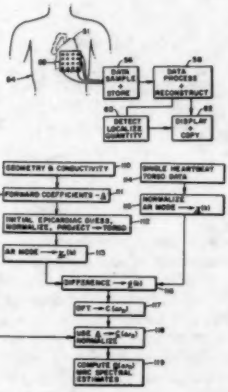
said complex signal from said complex signal converter means.

4,961,428

NON-INVASIVE METHOD AND APPARATUS FOR DESCRIBING THE ELECTRICAL ACTIVITY OF THE SURFACE OF AN INTERIOR ORGAN

Chrysostomos L. Nikias, Needham; Dana H. Brooks, Dorchester, both of Mass.; John H. Siegel, Baltimore, Md., and Miklos Fabian, Delta, Pa., assignors to Northeastern University, Boston, Mass. and University of Maryland, Baltimore, Md.

Filed May 2, 1988, Ser. No. 189,156
Int. Cl.[5] A61B *5/04*
U.S. Cl. 128—699 **10 Claims**



1. A method of reconstructing the electrical activity on the surface of an interior organ according to a plurality of non-invasively measured epidermal signals, comprising the steps of:

preparing a selected forward model;

adjusting the forward model according to selected physiological criteria;

recording said plurality of epidermal signals from an electrical array;

reconstructing a power signal spectrum of the electrical signals of a selected interior surface according to

said selected forward model, and

said recorded epidermal signals.

4,961,429

DIASTOLIC PRESSURE SENSOR

Kuo Wei Chang, and Shine Chang, both of 32 Buckman Dr., Lexington, Mass. 02173

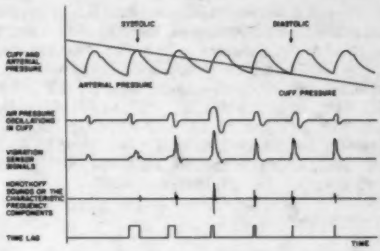
Filed Feb. 2, 1983, Ser. No. 462,803
Int. Cl.[5] A61B *5/021*
U.S. Cl. 128—680 **6 Claims**

1. A method of measuring diastolic pressure wherein a cuff bladder is used which includes:

sensing the arrival of an arterial pressure pulse said sensing independent of the time segment between the R-wave and said arterial pressure pulse;

sensing the initiation of a subsequent Korotkoff sound;

measuring the time lag between the arrival of the pressure pulse and the initiation of the Korotkoff sound; and



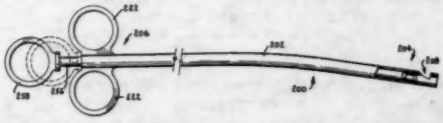
providing an output corresponding to the diastolic pressure when there is no measurable time lag between the arrival of the pressure pulse and the Korotkoff sound.

4,961,430

CERVICAL BIOPSY INSTRUMENT

John Sheahon, U-2, Rte. 4, Lake Lotawana, Mo. 64063

Filed Jul. 28, 1988, Ser. No. 225,346
Int. Cl.[5] A61B *10/00*
U.S. Cl. 128—754 **1 Claim**



1. A biopsy punch comprising:

an elongated housing having a distal end and a proximal end;

handle means on said housing for grasping said housing;

an elongated shaft having a configuration for slidable movement through said housing, said shaft having a distal end and a proximal end;

a notch in said housing at the distal end thereof for receiving a portion of tissue desired for a biopsy specimen therein;

an aperture at the distal end of said housing;

a cylindrical cutting blade having a proximal and distal ends at the distal edge of said shaft;

means for attaching said cylindrical cutting blade to the distal end of said shaft, said means comprising:

an annular shoulder at the distal end of said shaft, said shoulder being of a reduced configuration relative to said shaft to provide a base for said proximal end of said cylindrical cutting blade; and

a mounting tip extending from said shoulder, said mounting tip extending through said cylindrical cutting blade for a contiguous fit therewith, whereby to position said cutting blade at said distal edge of said shaft;

means at the proximal end of said shaft for applying pressure thereon causing slidable movement of said shaft with cutting blade through said housing, said distal end of said cutting blade capturing a portion of tissue protruding into said notch during said sliding movement and presenting the same at said aperture located at said distal end of said housing.

4,961,431

TOILET DEVICE WITH HEALTH EXAMINATION SYSTEM

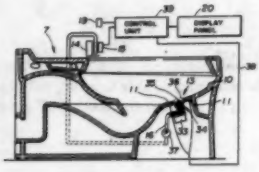
Takao Ikenaga; Toshifumi Shigematsu; Akio Kusumoto; Kimiyoshi Yamamoto, all of Kanagawa, and Masatoshi Yada, Fukuoka, all of Japan, assignors to Toto, Ltd., Fukuoka, Japan

Filed Jan. 27, 1988, Ser. No. 149,190

Claims priority, application Japan, Jan. 27, 1987, 62-16392; Jan. 27, 1987, 62-16393; Jan. 27, 1987, 62-10516[U]; Jan. 27, 1987, 62-10515[U]; Jan. 27, 1987, 62-10514[U]; Jan. 27, 1987, 62-10513[U]; Jan. 30, 1987, 62-20217; Jan. 30, 1987, 62-20216; Jan. 30, 1987, 62-20215; Jan. 30, 1987, 62-12528[U]; Jan. 30, 1987, 62-12529[U]; Jan. 30, 1987, 62-12530[U]

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—760 **39 Claims**



1. A toilet device with a health examination system, comprising:

a urine receiver;

first measuring means for sampling a portion of urine from said urine receiver and measuring the proportion of a particular constituent of the urine;

second measuring means for measuring at least one of the blood pressure, heart rate, and temperature of a user of said urine receiver; and

display means for displaying the results of measurement by said first and second measuring means.

4,961,432

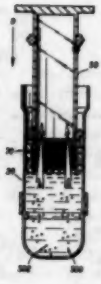
MODULAR FLUID SAMPLE PREPARATION ASSEMBLY

Raouf A. Guirguis, Gaithersburg, Md., assignor to Cancer Diagnostics, Inc., Rockville, Md.

Filed Jan. 10, 1989, Ser. No. 308,763

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—760 **38 Claims**



1. An apparatus for collecting biological fluids and holding a sample taken from a biological fluid for testing comprising a tubular container open at both ends; a fluid collection storage unit removably secured to one of said tubular container ends, said fluid collection storage unit having an open end and a closed end, a shuttle assembly slidably mounted in said tubular container, said shuttle assembly comprising a cylindrical hollow piston defining a chamber, a cover means covering one end of said piston and fluid flow means formed in said piston, said fluid flow means including a connector means communicating with said piston chamber, seal means mounted on the exterior surface of said piston to form a fluid tight seal with an interior surface of said elongated tubular container, and sample container means removably secured to said connector means, said sample container means being adapted to be seated in said collection storage unit after being slidably transported along said tubular container.

4,961,433

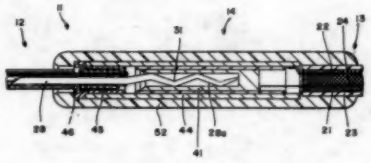
GUIDE WIRE ASSEMBLY WITH ELECTRICAL FUNCTIONS AND MALE AND FEMALE CONNECTORS FOR USE THEREWITH

Jeffrey J. Christian, San Jose, Calif., assignor to Cardiometrics, Inc., Mountain View, Calif.

Filed Nov. 2, 1988, Ser. No. 265,909

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—772 **7 Claims**



1. In a guide wire assembly, a flexible guide wire having a diameter of 0.018 inches or less and having first and second conductors extending along the length thereof, a flexible cable having first and second conductors extending along the length thereof, and connector means for interconnecting the flexible cable to said guide wire and interconnecting the conductors carried thereby, said connector means including a male connector and a female connector, said male connector comprising a sleeve, a conductive core were mounted in the sleeve, insulating means mounted in the sleeve and insulating the conductive core wire from the sleeve, a conductive cylindrical member carried by the insulating means and spaced from the sleeve, first and second conductors disposed within the sleeve with the first conductor being connected to the conductive core and the second conductor being connected to the conductive cylindrical member, said female connector comprising an inner conductive grip having a cylindrical recess for receiving the conductive core wire, an outer conductive grip having a cylindrical member engaging portion, insulating means disposed between the inner and outer conductive grips, an insulating case mounted on the outer conductive grip, first and second conductors disposed within the case with the first conductor being connected to the inner conductive grip and the second conductor being connected to the outer conductive grip, the female connector receiving the male connector with the inner conductive grip receiving the conductive core in the cylindrical recess of the inner conductive grip and with the outer conductive grip receiving the conductive member of the male connector by the cylindrical member engaging portion of the outer conductive grip engaging the conductive cylindrical member.

4,961,434

ARRAY OF RECESSED RADIALLY ORIENTED BIPOLAR ELECTRODES

Paul H. Stypulkowski, P.O. Box 33427, St. Paul, Minn. 55133

Filed Aug. 30, 1988, Ser. No. 238,553

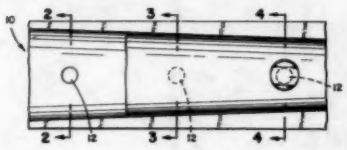
Int. Cl.[5] A61N *1/05*

U.S. Cl. 128—784 **11 Claims**

1. An electrode array for stimulating tissue in an animal body, comprising:

an elongated electrode body formed from an electrically insulating flexible material;

a second electrically insulating flexible material covering at least a portion of said body, said second material having at least one contact well formed therein and said second material formed separately of said body and at least partially adhered thereto;



at least one electrode positioned concentrically about said contact well having a recessed outer surface, said at least one electrode being disposed between said electrode body and said second material; and

said outer surface of said at least one electrode being exposed and adapted to make electrical contact with said tissue when the electrode array is implanted in said animal body.

4,961,435

HIGH-FREQUENCY CAPACITIVE HEATING ELECTRODE DEVICE

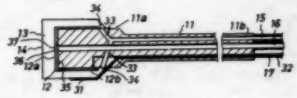
Kiyoshi Kitagawa, Chiba; Yoshio Hosoi, Sendai; Akira Sogawa; Chikau Onodera, both of Tokyo, and Tadashi Onuma, Inashiki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaishi, Tokyo, Japan

Filed Oct. 17, 1988, Ser. No. 258,513

Claims priority, application Japan, Oct. 28, 1987, 62-165167[U]

Int. Cl.[5] A61N 5/00

U.S. Cl. 128—788 **13 Claims**



1. An intracavitary electrode device for a high-frequency capacitive heating device, comprising:

a flexible member adapted to be inserted at a leading end portion thereof into an intracavity of an endotract organ of a living body;

a cap-shaped electrode disposed around said leading end portion covering both of an end surface of said leading end portion and a circumferential surface of said leading end portion, said circumferential surface being adjacent to said end surface;

a flexible polymer film enclosing said cap-shaped electrode so as to form a gas-tight space in association with said cap-shaped electrode and said flexible member, and secured on said flexible member at one end thereof;

an introducing passage disposed in said flexible member for introducing a cooling medium into said gas-tight space; and

a discharging passage disposed in said flexible member for discharging said cooling medium from said gas-tight space,

each of said introducing passage and said discharging passage communicating with said gas-tight space.

4,961,436

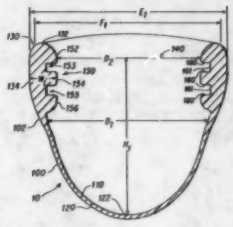
CONTRACEPTIVE CERVICAL CAP

James P. Koch, Brookline, Mass., assignor to Brigham and Women's Hospital, Boston, Mass.

Continuation of Ser. No. 74,992, Jul. 17, 1987, abandoned. This application Apr. 12, 1989, Ser. No. 338,517

Int. Cl.[5] A61F 5/46

U.S. Cl. 128—837 **19 Claims**



10. A cervical cap for covering a portion of the cervix uteri comprising:

a rim portion, an open end portion, a ridged section, and a dome-shaped portion made of a flexible resilient material;

said dome-shaped portion being disposed opposite said open end portion;

said ridged section having inner and outer surfaces;

first and second ring-shaped ridge portions defined by a recess formed by substantially parallel walls along said inner surface, said first and second ring-shaped ridge portions having a blunt inner edge;

said ridged section being located adjacent said open end portion and being adapted to grip the cervix, and

said substantially parallel walls being adapted to remain substantially fixed and substantially parallel to form a substantially fluid tight fit while said cap is placed over a portion of the cervix.

4,961,437

WRAPPING FOR BAGPACKS AND A PROCESS AND APPARATUS FOR PRODUCING IT

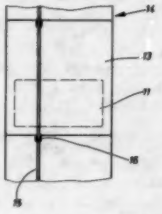
Heinz Focke, and Oskar Balmer, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Sep. 4, 1985, Ser. No. 772,502

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1984, 3433608

Int. Cl.[5] A24C 5/00

U.S. Cl. 131—112 **9 Claims**



1. Process for producing wrappings consisting of weldable film, each receiving a twist-bag, a wrapping blank (13) first being laid round the twistbag in the form of a U, and projecting edge regions, including longitudinal edge strips and transverse edge strips, being welded to one another, said process comprising the steps of: after the wrapping blank (13) has been folded

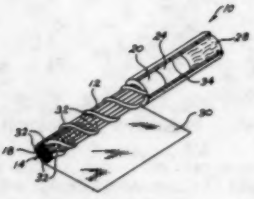
round the twistbag in the form of a U, first making the longitudinal welding seam (18) in the region of the longitudinal edge strip (17); then folding the longitudinal edge strip (17) round against one of the wrapping walls (19, 20); and finally making the transverse welding seams (21, 22) in the region of the transverse edge strips (23, 24) so that opposite ends of the folded-found longitudinal edge strip (17) are welded at the same time to said one wrapping wall.

4,961,438

SMOKING DEVICE

Steven J. Korte, Ramsey, Ind., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Apr. 3, 1989, Ser. No. 331,779
Int. Cl.[5] A24B *15/00*; A24D *1/18*
U.S. Cl. 131—360 **12 Claims**



1. A smoking device comprising:
a cylindrical tube having a reticulated wall open at both ends to provide a gas inlet at one end and a gas outlet at the other end, the tube being fabricated of a non-combustible heat conducting material;
an aerosol generating material inside the reticulated cylindrical tube;
an insulating collar concentrically disposed around a portion of the length of the reticulated tube between the ends of the reticulated tube;
a cylindrical body of flavor releasing material concentrically surrounding the reticulated tube between the insulating collar and a first one of the ends of tube;
means defining a nucleating chamber axially aligned with the cylindrical body of flavor material immediately adjacent the cylindrical body and open to the cylindrical body; and,
a filter plug axially aligned with the chamber at the other end thereof from the cylindrical body;
at least one ribbon of fuel material spirally wound around the exterior wall surface of the reticulated tube extending along the length of the reticulated tube from the gas inlet end of the tube to the insulating collar with a space between adjacent turns of the spirally wound ribbon; and,
a non-combustible wrapper circumferentially disposed over the at least one spirally wound fuel ribbon.

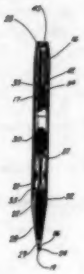
4,961,439

HAIR STREAKING APPARATUS

Judy Hartmann, Rte. 2, Box 935 "P", Reserve, La. 70084

Filed Dec. 16, 1988, Ser. No. 285,669
Int. Cl.[5] A45D *7/02*
U.S. Cl. 132—212 **10 Claims**

1. A hair streaking pin comprising:
(a) a pin portion, having a substantially cylindrical elongated body, with a hook portion on a distal end thereof;
(b) a housing having an upper and lower portion, and having an open end on its lower portion, for allowing the hook portion of the pin to extend out from the housing;
(c) first spring means in the lower portion of the housing, for returning the pin to its normal position within the housing after the hook portion of the pin has grasped strands of hair;
(d) second spring means positioned within the upper portion of the housing for returning the pin to its normal position within the housing after the pin has moved inward against the bias of the second spring means when the hook portion has struck a scalp; and



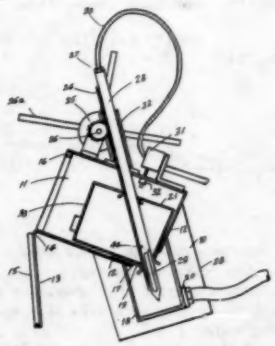
(e) means within the housing for preventing rotation of the pin within the housing during the hair streaking process.

4,961,440

CHEMICAL DISPENSING APPARATUS

Philip H. Wright, Atherstone, England, assignor to Schering Agrochemicals Ltd., England

Filed Jun. 30, 1989, Ser. No. 374,440
Claims priority, application United Kingdom, Jul. 2, 1988, 8815787
Int. Cl.[5] B08B *3/02*, *9/08*
U.S. Cl. 134—167 R **12 Claims**

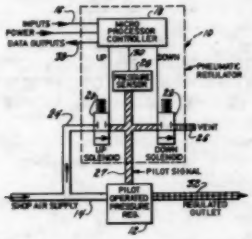


1. Chemical dispensing apparatus comprising a chamber in which a chemical container can be enclosed and supported, draining means provided at a lower portion of said chamber and a hollow perforated wash pipe mounted on said chamber so as to be moveable into the interior thereof to pierce twice any container supported therein, said wash pipe being connected to a diluent supply, characterised in that the chamber is provided with means for supporting the container in a generally tilted manner such that a corner thereof is presented as the lowest portion and the wash pipe is arranged to pierce the container through said corner, means being provided on the wash pipe to hold apart the lowest pierced portion of the container and one or more nozzles being provided to spray diluent over a substantial part of the interior of the container while the pierced portion is held apart.

4,961,441
METHOD AND SYSTEM FOR CONTROLLING A PRESSURE REGULATOR

Stuart C. Salter, 2920 Dixie Hwy., Pontiac, Mich. 48055

Filed Nov. 13, 1989, Ser. No. 434,182
Int. Cl.[5] F16K *31/12*
U.S. Cl. 137—14 19 Claims



1. A method for controlling a pressure regulator and an electric actuator means for operating the pressure regulator to control the pressure of control fluid regulated by the pressure regulator in response to a reference signal, the method comprising the steps of: generating feedback signals including a first feedback signal as a function of the actual pressure of the regulated control fluid; generating an error signal based on the difference between the reference signal and the feedback signals, the error signal being representative of a desired amount of control fluid pressure change; and generating a first control signal as a function of the error signal to control the actuator means, wherein the improvement comprises:

generating an expected pressure differential signal based on the difference between the reference signal and the first feedback signal;

generating a second feedback signal as a function of the pressure of the regulated control fluid in response to the first control signal;

generating an actual pressure differential signal as a function of the difference between the first and second feedback signals;

generating a correction factor based on the difference between the actual pressure differential signal and the expected pressure differential signal;

modifying the error signal as a function of the correction factor;

storing the correction factor; and

generating a second control signal as a function of the modified error signal to control the actuator means as a function of the actual level of regulated control fluid pressure to compensate for varying system operating conditions.

4,961,442
DYNAMIC CONTAINMENT DEVICE

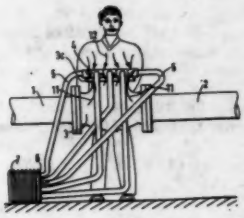
Jean-Pierre Crespin, Chinon, and Frederic Saulay, La Chartre Sur Le Loir, both of France, assignors to Polinorsud, France

Filed Mar. 13, 1989, Ser. No. 322,671
Claims priority, application France, Mar. 18, 1988, 8803841
Int. Cl.[5] G21F *9/02*
U.S. Cl. 137—312 7 Claims

1. A dynamic containment device for use outside and in the vicinity of an orifice, comprising:

means for collecting by aspiration, said means for collecting being capable of corresponding in profile to a contour of a border of an orifice, said means for collecting including a plurality of unitary elements capable of being placed in an adjacent manner in position on a border of an orifice, each unitary element including an aspiration opening; and

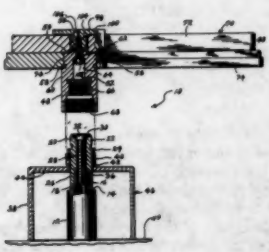
a plurality of flexible outlet conduits corresponding in number to said aspiration openings, each of said flexible outlet conduits attached at a first end to one of said aspiration openings, an evacuation conduit capable of being connected to a vacuum means, and a single linkage adaptor connected between said evacuation conduit and second ends of said flexible outlet conduits.



4,961,443
HANDLE ASSEMBLY

Dana F. Buccicone, Kohler; Thomas E. Gaffney; Clarence E. Klessig, both of Sheboygan, and Alan J. Weir, New Holstein, all of Wis., assignors to Kohler Co., Kohler, Wis.

Filed Dec. 12, 1989, Ser. No. 449,687
Int. Cl.[5] F16K *31/60*
U.S. Cl. 137—315 9 Claims



1. A handle assembly attachable to a rotatable stem, comprising:

an adapter element fixedly mountable on the stem to rotate therewith, said adapter element having an outer engagement surface;

an escutcheon mounted on the adapter and having a threaded portion and a central opening, said central opening sized so as not to permit said adapter element to pass completely therethrough;

a post member having:

(a) a first upper engagement surface;

(b) a second lower engagement surface adapted to engage said outer engagement surface of said adapter element, the engagement of said second engagement surface and said outer engagement surface causing said post member to rotate with said adapter element; and

(c) a threaded portion for rotatively engaging said threaded portion of said escutcheon, said threaded portion of said post member and said threaded portion of said escutcheon rotatively engageable to sandwich said adapter element between said escutcheon and said post member;

a handle having an interior engagement surface adapted to engage said first engagement surface of said post member, the engagement of said interior engagement surface and said first engagement surface causing said post member to rotate with said handle; and

an upwardly-directed bolt for securing said handle to said post member.

4,961,444

CLAMP ASSEMBLIES

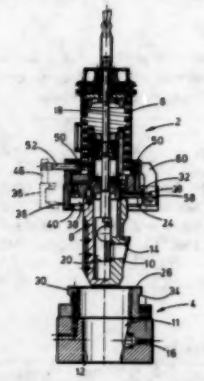
Ian H. Morgan, Torwood, and Sean McAvoy, Burnside View, both of Scotland, assignors to Cooper Industries, Inc., Houston, Tex.

Filed Jul. 19, 1989, Ser. No. 382,609

Claims priority, application United Kingdom, Jul. 21, 1988, 8817358

Int. Cl.[5] F16K *43/00, 51/00*

U.S. Cl. 137—315 **8 Claims**



6. A valve assembly comprising:

a valve receiving member arranged in a pipeline so as to permit the insertion of an insert valve member therein to provide communication between said insert valve member and the bore of the pipeline,

a longitudinal axis of the insert valve member lying perpendicular to the center line of the pipeline bore, wherein the insert valve member is provided with an at least partly frustoconical nose portion adapted to be received within a complimentarily contoured hollow chamber of the valve receiving member,

each of said insert valve member and said valve receiving member having annular flanges with abutable surfaces and being provided with sealing surfaces adapted to be rendered fluid tight in contact by the provision of an annular clamping means comprising two clamping elements adapted to encircle the annular flanges in abutting relationship,

a mounting member adapted to be secured to one of the valve members to be clamped, at a location spaced from the abutable surface of said annular flanges,

said mounting member including a plurality of elongate guide means projecting therefrom, said guide means extending in two opposed directions in a plane parallel to the plane of the confronting, abutable surfaces of said annular flanges, wherein each said clamping element is suspendedly and slidably mounted upon respective guide means for inward and outward movement along said guide means between said spaced-apart condition and a clamped condition and

said guide means being provided with outer end portions having first dimensions and said clamping elements having cooperable means for cooperatively engaging said outer end portions to suspend the clamping elements in a rigid manner when in their spaced-apart condition, said guide means being further provided with inner portions having second dimensions for cooperative engagement with said cooperable means to allow limited vertical adjusting movement of the clamping elements as they move towards the clamped condition,

the arrangement being such that the clamping assembly is adapted to clamp one of said abutable surfaces provided on said valve body against a second confronting abutable surface provided on said valve receiving member whereby said insert valve member may be removed from said valve receiving member for maintenance purposes.

4,961,445

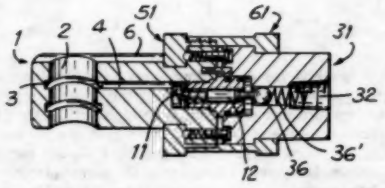
CONNECTING DEVICE FOR CONNECTING LIQUID CONSUMER TO LIQUID SOURCE

Steve Spirer, Haworth, N.J., assignor to UNEX Corporation, South Hackensack, N.J.

Filed Aug. 10, 1989, Ser. No. 392,135

Int. Cl.[5] F16L *29/00*

U.S. Cl. 137—614.04 **12 Claims**



1. A connecting device for connecting a source of hydraulic medium with a consumer of a hydraulic medium, such as a hydraulic tool, comprising a first connecting element arranged to be connected with a consumer and having at least one throughgoing passage, at least one first valve member arranged in said throughgoing passage, at least one locking member spring biased in a first axial direction; a second connecting element arranged to be connected with a source and having at least one throughgoing passage, at least one second valve member located in said throughgoing passage and cooperating with said first valve member so as to form a valve upon assembly of the connecting device; and coupling means for coupling said first connecting element with the second connecting element and including a first coupling member provided with a first thread and supported on said first connecting element turnably between a locked position in which it is locked by said locking member to prevent its rotation and an unlocked position, and a second coupling member turnably supported on said second connecting element and having a second thread which is screwable with said first thread of said first coupling member so that when said first coupling member is locked on said first connecting element and said second coupling member is screwed on said first coupling member, said connecting elements are connected with one another and said valve members cooperate with one another so as to open said valve and communicate said throughgoing passages to allow passage of a hydraulic medium from the source to the consumer.

4,961,446

CONTAINER FILLING SYSTEM

Marvin I. Berg, Tacoma; Stavros Mihail, Seattle, and John E. Oman, Edmonds, all of Wash., assignors to Promation Incorporated, Seattle, Wash.

Continuation-in-part of Ser. No. 271,385, Nov. 9, 1988, Pat. No. 4,893,660, which is a continuation of Ser. No. 81,972, Aug. 5, 1987, abandoned. This application Jun. 29, 1989, Ser. No. 374,522

Int. Cl.[5] B65B *39/12*

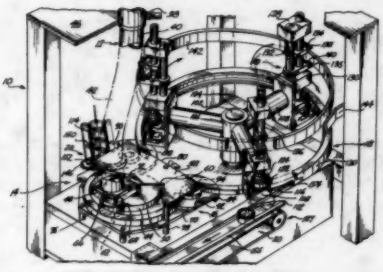
U.S. Cl. 141—144 **20 Claims**

1. A container filling system for introducing controlled

volumes of filler material into containers, the system comprising:

measuring means for receiving a predetermined volume of filler material, said measuring means rotatable about a primary axis;

rotatable feed means for introducing filler material into at least two of said measuring means upon each rotation of



said feed means, said feed means introducing said filler material into said measuring means under pressure and along a first axis defined with respect to said measuring means; and

discharge means for discharging filler material from said measuring means along the first axis and into a container, said discharge means rotatable about a secondary axis different from the primary axis.

4,961,447

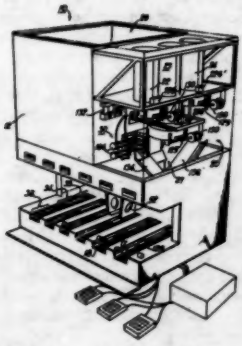
AUTOMATIC BEVERGE DISPENSING SYSTEM

William S. Credle, Jr., Stone Mountain; Lawrence B. Ziesel, Marietta, and Mark S. Heflin, Atlanta, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 174,742, Mar. 29, 1988. This application Jul. 3, 1989, Ser. No. 375,547

Int. Cl.[5] B65B *3/04, 43/42*

U.S. Cl. 141—1 **7 Claims**



1. A method for automatically dispensing any one of a plurality of different beverages into any one of a plurality of different size cups comprising the steps of:

(a) placing a cup of a selected size at a cup drop station of an automatic beverage dispenser;

(b) dropping a selected quantity of ice into said cup at an ice drop station;

(c) conveying said cup using a first conveyor system, from said cup drop station to a cup transfer station on a selected one of a plurality of second conveyor systems, and placing said cup onto a cup transfer station of said selected one of said plurality of second conveyor system;

(d) conveying said cup, using said selected one of said plurality of second conveyor system from said cup transfer station forward of said housing to a beverage fill station;

(e) filling said cup with the selected beverage at said fill station; and

(f) moving the filled cup, using said selected one of said plurality of second conveyor system, from said fill station to a pick-up station to make the filled cup accessible to an operator for removal from said automatic dispenser.

4,961,448

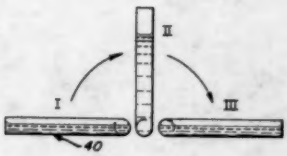
PRESSURE VESSEL FOR DISPENSING MATERIALS AND METHOD FOR FILLING SAME

Ronald E. Timm, Hickory Hills, Ill., assignor to R. E. Timm & Associates, Inc., Hinsdale, Ill.

Division of Ser. No. 874,234, Jun. 13, 1986. This application Nov. 10, 1988, Ser. No. 269,590

Int. Cl.[5] B65B *3/04*

U.S. Cl. 141—9 **3 Claims**



1. A method of filling with a liquid and pressurizing a system of generally parallel elongated vessels each connected at one end to a common manifold comprising:

orienting the system so that the longitudinal axis of said elongated vessels lie in a horizontal plane;

introducing a pressurized gas and the liquid into the system until the desired level of liquid and gas pressure are obtained;

sealing the system; and,

erecting the vessels simultaneously 90° to produce descrete gas containing ullages at the top of each vessel.

4,961,449

RESERVOIR CAP

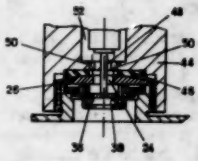
Chantal Demesutis, Livry Gargan, and Pascal Picot, Bonneuil Sur Marne, both of France, assignors to Bendix France, Drancy, France

Filed May 5, 1989, Ser. No. 348,343

Claims priority, application France, May 31, 1988, 88 07241

Int. Cl.[5] B65B *1/04*

U.S. Cl. 141—348 **1 Claim**



1. In combination, a cap adapted for an annular filling opening of a reservoir of brake fluid connected to the brake circuit of a vehicle and a filling head adapted for evacuating and filling said brake circuit with said brake fluid, said opening having an axis, said cap comprising an air passage normally open to atmosphere and offset from said axis, the passage including baffle means for preventing escape of brake fluid,

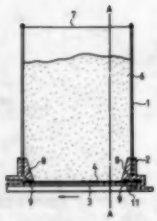
and located on said axis a filling cap aperture bounded by an adjacent inner part of the cap, the adjacent inner part including ribs, and valve means allowing an evacuation of said brake circuit and a speedy filling of the circuit with said brake fluid during assembly line production of said vehicle, said valve means including a valve member movable axially against a spring biasing said valve member to normally close said filling cap aperture, the valve member having complementary shaped recesses receiving the ribs, said evacuation and filling being completed by means of the filling head which is provided with a thrust rod for opening said valve member and with an annular seal for closing said air passage during the evacuation and filling.

4,961,450

TONER CARTRIDGE

Haruo Furuta, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 9, 1989, Ser. No. 349,287
Claims priority, application Japan, Jun. 20, 1988, 63-149953
Int. Cl.[5] B65D *25/38, 43/02*
U.S. Cl. 141—364 **13 Claims**



1. A toner cartridge comprising:
a toner container body having an opening at the bottom and an inner wall having a lower end portion;
a mouth ring member provided at said opening and having a bonding region to which a sealing film is bonded and having a non-bonding region which extends radially inward from the entire inner edge of said bonding region, said bonding region protruding above said non-bonding region, said bonding region protruding above said non-bonding region and having an inner edge, and said sealing film being adapted to seal said opening in such a manner that said sealing member can be peeled off said bonding region in a direction relative to said toner container body when required; and
a lid supported under said sealing film in such a manner that said lid is slidable with respect to said toner container body in said direction relative to said toner body.

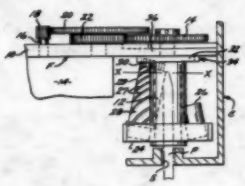
4,961,451

SHARPENER FOR RECTANGULAR PENCILS

Albert W. Bucci, 27253 Eastvale Rd., Rolling Hills Estates, Calif. 90274

Continuation-in-part of Ser. No. 48,265, May 11, 1987, abandoned. This application Jul. 29, 1988, Ser. No. 225,937
The portion of the term of this patent subsequent to Nov. 9, 2006, has been disclaimed.
Int. Cl.[5] B23B *5/00*
U.S. Cl. 144—28.7 **5 Claims**

1. A pencil sharpening device for rectangular pencils comprising a frame, an endless track formed by an elliptical internal gear attached to said frame, a cutter means engaged in said elliptical internal gear on one end, a cutter support means coupled to said frame and rotatable on an axis that aligns with the center of said elliptical internal gear and coupled to the other end of said cutter means so that as said cutter support means is rotated said cutter means orbits through an elliptic conic area extending upward from an apex adjacent said elliptical internal gear, and a rectangular pencil slot connected to said frame and aligned with its long dimension in the same



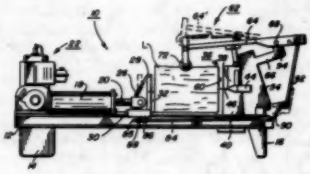
direction as the long axis of said elliptical internal gear and with its center aligned with said center of said elliptical internal gear for holding a pencil in position for sharpening by said cutter means.

4,961,452

LOG SPLITTING APPARATUS

John L. Hudson, Rte. 1, Box 364, Florence, S.C. 29501

Filed May 3, 1989, Ser. No. 346,692
Int. Cl.[5] B27L *7/00*
U.S. Cl. 144—193 A **16 Claims**



1. A log splitting apparatus, comprising:
log bed means upon which logs to-be-split are supported for being moved therealong;
power ramming means for driving a log along said log bed means toward a log splitting station to be split thereat;
a sensing mechanism, situated adjacent said log splitting station, for sensing a log being driven towards said station and responsively assuming an indexed position in accordance with the sensed diameter of such log;
a cutter blade assembly arranged at said log splitting station in the path of movement of a log for splitting such log as the same is driven against said cutter blade assembly by said power ramming means; and
automatic blade adjustment means, associated with said sensing mechanism and said cutter blade assembly, for selectively positioning said cutter blade assembly relative said log bed means in accordance with said indexed position assumed for a given log, thereby automatically controlling the relative position of said cutter blade assembly in accordance with the sensed diameter of such given log.

4,961,453

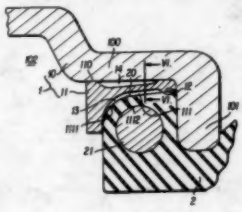
WHEEL RIM FOR A REVERSED HOOKED TIRE

Pierre Durif, Volvic, France, assignor to Compagnie Generale Des Etablissements Michelin-Michelin & Cie, Clermont-Ferrand, France

Filed Jun. 2, 1989, Ser. No. 360,441
Claims priority, application France, Jun. 9, 1988, 88 07831
Int. Cl.[5] B60C *15/06*
U.S. Cl. 152—379.3 **6 Claims**

1. A wheel rim for a reversed hooked tire comprising:
a collar having two symmetrical halves respectively disposed on either side of a median plane transverse to the

wheel axis, each of said halves comprising an axially extending annular zone connected to an annular radially inwardly extending rim edge, wherein an inverted bead of a tire mounted to the wheel is positioned such that the axially extending zone is axially aligned with, and radially outside of, said bead, said bead having an axially extending



tapered surface which faces said axially extending zone, and wherein said rim edge is radially aligned with said bead so as to form an axial stop therefor; and

a removable annular seat having a radially inner face, said seat extending axially between said axially extending tapered surface of said bead and said axially extending zone.

4,961,454

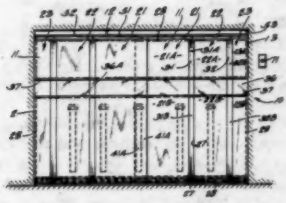
INSULATED FOLDING DOOR

Paul J. Reilly, Jr., 2314 North Lincoln Park West, Chicago, Ill. 60614, and Charles C. Harrett, Jr., 2456 Normandy, Apt. 305A, Grand Rapids, Mich. 49506

Filed Jun. 11, 1986, Ser. No. 872,805

Int. Cl.[5] A47H *5/00*

U.S. Cl. 160—344 **7 Claims**



1. A fan-foldable, insulated curtain, comprising:

a plurality of spaced-apart, elongated, insulated panel sections each comprising thermal insulation and a cover enclosing said insulation; and

at least one hinge section spanning adjacent panel sections, said hinge section comprising a flexible sheet which is thinner than said panel sections, is capable of being folded over itself, and has a width at least as large as the thickness of said thermal insulation, further comprising at least one pocket disposed on at least one of said panel sections, and a weight disposed inside of said pocket, wherein said weight comprises an elongated, flexible tube filled with soft matter.

4,961,455

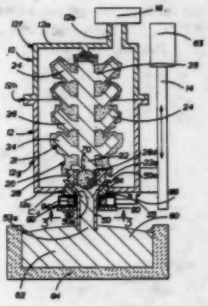
COUNTERGRAVITY CASING APPARATUS AND METHOD WITH MAGNETICALLY ACTUATED VALVE TO PREVENT MOLTEN METAL RUN-OUT

John A. Redemske, Mont Vernon, N.H., and Merton C. Flemings, Cambridge, Mass., assignors to Hitchiner Manufacturing Co., Inc., Milford, N.H.

Filed Jul. 6, 1989, Ser. No. 376,133

Int. Cl.[5] B22D *18/06, 27/02*

U.S. Cl. 164—63 **29 Claims**



1. Apparatus for countergravity casting of molten metal, comprising:

(a) a mold having a mold cavity for receiving the molten metal and molten metal inlet passage means for supplying the molten metal to the mold cavity, said inlet passage means including a lower open end adapted for immersion in an underlying molten metal pool,

(b) magnetically responsive valve means disposed in the inlet passage means for movement between an upper open position for permitting the molten metal to flow thereby to the mold cavity when said lower open end is immersed in said molten metal pool with a negative differential pressure established to draw the molten metal upwardly through said inlet passage means and a lower closed position for preventing molten metal flow from the mold cavity after it is filled with molten metal, and

(c) means for subjecting the valve means to a magnetic force after the mold cavity is filled with the molten metal to move the valve means to the closed position to prevent flow of the molten metal from the metal-filled mold cavity when said lower open end is removed from said pool.

17. A method of countergravity casting molten metal, comprising:

(a) providing a mold having a mold cavity and a molten metal inlet passage means with a lower open end adapted for immersion in an underlying molten metal pool,

(b) relatively moving the mold and the pool to immerse said lower open end in the pool,

(c) applying a differential pressure between the mold cavity and the pool to urge the molten metal upwardly through the inlet passage means into the mold cavity thereabove to fill the mold cavity with the molten metal, including opening a magnetically responsive valve means disposed in the inlet passage means to an upper open position to permit the molten metal to flow thereby to the mold cavity as the molten metal is urged upwardly through the inlet passage means,

(d) applying a magnetic force to the open valve means after the mold cavity is filled with the molten metal to move said valve means to a lower closed position where said valve means prevents flow of molten metal from the metal-filled mold cavity, and

(e) relatively moving the mold and the pool to remove said open lower end from the pool with said valve means being in the closed position.

4,961,456

AUTOMATIC CONTROL SYSTEM FOR FILLING BEVERAGE CONTAINERS

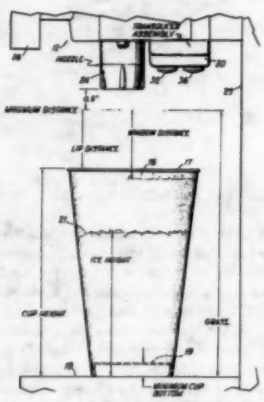
William F. Stembridge, College Park, Ga.; James C. Sturrock, Espanola, N. Mex., and W. Frank Stembridge, East Point, Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

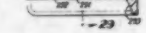
Division of Ser. No. 48,111, May 8, 1987, which is a continuation-in-part of Ser. No. 684,215, Dec. 20, 1984, abandoned, which is a continuation-in-part of Ser. No. 629,397, Jul. 10, 1984, abandoned. This application Nov. 21, 1988, Ser. No. 274,092

The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.

Int. Cl.[5] B67C *3/00*

U.S. Cl. 141—1 **2 Claims**





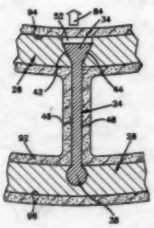
(B) injecting molten metal into said die;
(C) permitting said metal to soldify to form said casting around said core and to disintegrate the base of said core;
(D) removing said casting and core from said die; and
(E) separating said casting from said core by shaking the disintegrated core from said solid casting.

4,961,459

METHOD OF MAKING AN IMPROVED TURBINE ENGINE COMPONENT

William S. Blazek, Valley City, Ohio, assignor to PCC Airfoils, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 301,867, Jan. 25, 1989. This application Jun. 9, 1989, Ser. No. 364,702
Int. Cl.[5] B22D *19/04*
U.S. Cl. 164—122.1 **44 Claims**



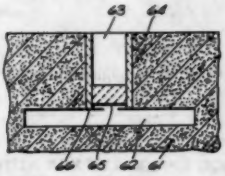
1. A method of making a turbine engine component having a plurality of airfoils disposed in an annular array between inner and outer shroud rings, said method comprising the steps of positioning a plurality of airfoils in an annular array with outer end portions of the airfoils at least partially embedded in an outer shroud ring pattern and with inner end portions of the airfoils at least partially embedded in an inner shroud ring pattern, covering the shroud ring patterns with mold material to form a mold, removing the shroud ring pattern material from the mold to leave inner and outer shroud ring mold cavities having configurations corresponding to the configurations of the shroud ring patterns, the inner and outer end portions of the airfoils being at least partially disposed in the shroud ring mold cavities, filling the inner and outer shroud ring mold cavities with molten metal, said step of filling the inner and outer shroud ring mold cavities with molten metal including at least partially enclosing the inner and outer end portions of the airfoils with molten metal, solidifying the molten metal in the inner and outer shroud ring mold cavities to form the inner and outer shroud rings, and forming cavities in at least one of the shroud rings at locations adjacent to end portions of the airfoils by moving the airfoils and the one shroud ring relative to each other.

4,961,460

MOULDS FOR METAL CASTING AND SLEEVES CONTAINING FILTERS FOR USE THEREIN

David R. Butler, Lichfield; George Snow, Worcester; Philip Sandford, Birmingham; Max G. Neu, Lichfield, all of United Kingdom; Jean P. Villani; Alain Teyssedre, both of Charleville Mezieres, France, and Roland Lenoir, Flize, France, assignors to Foseco International Limited, Birmingham, England

Continuation of Ser. No. 298,049, Jan. 18, 1989, Pat. No. 4,928,746. This application Mar. 1, 1990, Ser. No. 486,940
Claims priority, application United Kingdom, Jan. 30, 1988, 8802082; Jan. 30, 1988, 8802083; Jul. 30, 1988, 8818186; Jul. 30, 1988, 8818229
The portion of the term of this patent subsequent to May 29, 2007, has been disclaimed.
Int. Cl.[5] B22C *9/08*
U.S. Cl. 164—134 **43 Claims**



1. A method for casting metal in a mould comprising the steps of:
providing a mould cavity having one or more sprues communicating directly with the mould cavity and providing the sole means of entry of molten metal into said mould cavity for forming a casting;
locating a sleeve of refractory material in each said sprue;
disposing a ceramic foam filter in each said sleeve such that, when the sleeve is located in a sprue, the filter is spaced from the surface of the casting defined by the mould cavity; and
pouring molten metal into said sleeve and through said filter into said mould cavity thereby affording a smooth, substantially non-turbulent flow of molten metal through said filter into said cavity.

4,961,461

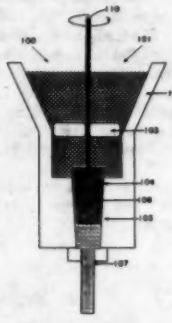
METHOD AND APPARATUS FOR CONTINUOUS CASTING OF COMPOSITES

Eric Klier, Irving, Tex.; Andreas Mortensen, Cambridge, Mass.; James A. Cornie, North Chelmsford, Mass., and Merton C. Flemings, Cambridge, Mass., assignors to Massachusetts Institute of Technology, Cambridge

Filed Jun. 16, 1988, Ser. No. 207,573
Int. Cl.[5] B22D *11/00*
U.S. Cl. 164—461 **10 Claims**

1. The process for the continuous manufacture of a composite of a plurality of discrete and substantially uniformly dispersed solid dispersates within a matrix material comprising:
introducing a fluid precursor of the matrix material and dispersates under pressure into a vessel through matrix and dispersate material entrance regions;
initially infiltrating the dispersate material with the fluid matrix material to provide a concentrated dispersion having no more than five volume percent porosity;
dispersing the concentrated dispersion into the fluid matrix

material by highly shearing the matrix material and the concentrated dispersion to provide the composite; and



casting the composite through a composite exit region of the vessel.

4,961,462

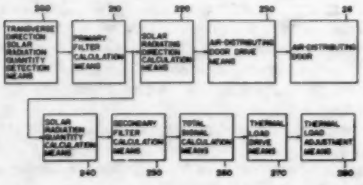
CONTROL APPARATUS FOR AUTOMOBILE AIR-CONDITIONERS

Katsumi Iida, and Akihiko Takano, both of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1989, Ser. No. 436,792

Int. Cl.[5] B60H *1/00, 3/00*; F24F *11/02, 13/10*

U.S. Cl. 165—12 **3 Claims**



1. An apparatus for controlling an automobile air-conditioner, comprising:

(a) at least one transverse direction solar radiation quantity detection means having two light receiving surfaces inclined at an angle and facing transversely of the direction of movement of an automobile;

(b) primary filter calculation means for smoothening rapid fluctuations of a solar radiation signal detected by said transverse direction solar radiation quantity detection means;

(c) solar radiating direction calculation means for calculating the direction of solar radiation by using the result of calculation by said primary filter calculation means;

(d) solar radiation quantity calculation means for calculating the quantity of solar radiation received in a vehicle passenger compartment by using the result of calculation by said primary filter calculation means;

(e) secondary filter calculation means for changing an output signal from said solar radiation quantity calculation means in such a manner that said output signal increases progressively at a first predetermined gradient from the leading edge of the detection of solar radiation and also decreases progressively at a second predetermined gradient from the time near the trailing edge of the detection of solar radiation;

(f) total signal calculation means for calculating a total signal corresponding to a thermal load in the vehicle passenger compartment based on at least a vehicle passenger compartment temperature, a setting temperature and the result of calculation by said secondary filter calculation means;

(g) air-distributing door drive means for actuating an air-distributing door based on the result of calculation by said solar radiating direction calculation means;

(h) thermal load adjustment means for adjusting the thermal load on said automobile air-conditioner, said adjustment means including at least an air-flow duct opening to the vehicle passenger compartment, a blower disposed in said duct for forcing air downstream through said duct to the vehicle passenger compartment, a heat exchanger disposed in said duct for subjecting air to heat-exchanging process as the air is forced to pass around said heat exchanger; and

(i) thermal load drive means for driving said thermal load adjustment means based on the result of calculation by said total signal calculation means.

4,961,463

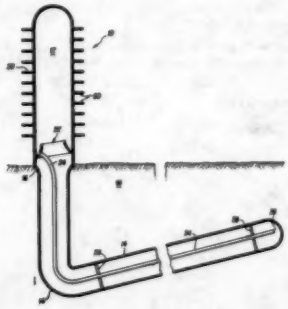
THERMOSYPHON CONDENSATE RETURN DEVICE

Stephen L. DenHartog, Hanover, N.H.; John P. Zarling, Fairbanks, Ak., and Francis D. Haynes, Etna, N.H., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 26, 1989, Ser. No. 343,219

Int. Cl.[5] F28D *15/02*

U.S. Cl. 165—45 **20 Claims**



1. A thermosyphon comprising:

a. a condenser section;

b. a evaporator section disposed at a negative slope;

c. a working fluid evaporated within the evaporator section and condensed within the condenser section to transfer heat from the environment of the evaporator section to the environment of the condenser section;

d. means disposed within the condenser section for collecting condensed working fluid; and,

e. means communicating with the collecting means for ducting the condensed working fluid from the collecting means to the evaporator section.

4,961,464

MASS AND/OR HEAT EXCHANGER WITH THERMAL EXPANSION RELIEF

Rudi Wollbeck, Erlenbach, and Thomas Zang, Goldbach, both of Fed. Rep. of Germany, assignors to Akzo N.V., Netherlands

Filed Sep. 18, 1989, Ser. No. 408,267

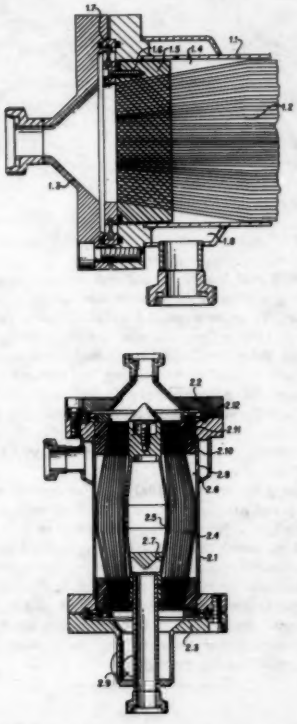
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1988, 3831786

Int. Cl.[5] F28F *7/00*

U.S. Cl. 165—83 **11 Claims**

1. A mass and/or heat exchanger, comprising at least one bundle of capillaries having lumens, ends of said capillaries being embedded in a casting composition, and a housing in which the capillaries with the casting composition are ar-

ranged such that the casting composition forms a liquid-tight isolation between the lumens of the capillaries and space outside the capillaries within the housing, wherein an elastic ring flange which compensates for differences in changes of length of the bundle of capillaries and the housing, is readily removably provided between the casting composition and the housing, said elastic ring flange including an inner non-elastic ring,



an outer non-elastic ring and an elastic ring located between and attached to said inner and outer non-elastic rings, said inner non-elastic ring, outer non-elastic ring and said elastic ring being firmly connected together to form one part, said elastic ring having no bores therethrough and said inner non-elastic ring being readily removably attached to said casting composition.

4,961,465

CASING PACKER SHOE

John T. Brandell, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 257,172, Oct. 11, 1988, abandoned, which is a continuation of Ser. No. 25,048, Mar. 12, 1987, abandoned. This application Jul. 24, 1989, Ser. No. 384,048

Int. Cl.[5] E21B *33/124, 33/126*

U.S. Cl. 166—184 **12 Claims**

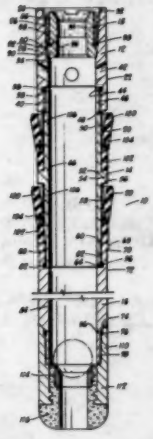
1. A cup type formation packer shoe for cementing a smaller diameter casing or tubing in existing casing cemented in a well bore, said cup type formation packer shoe comprising:

a unitary upper adapter, threadedly engaged to said smaller diameter tubing, said upper adapter including a plurality of holes therethrough;

an elongated cylindrical cup housing having one end thereof secured to the upper adapter, said cup housing including a substantially cylindrical outer surface having a first and second annular shoulder extending outwardly therefrom, said first annular shoulder oriented in a direction towards said upper adapter and said second annular shoulder oriented in a direction opposite said first annular shoulder;

a substantially cylindrical lower adapter having an outside diameter such that when one end of said lower adapter is secured to the other end of the cup housing, a third annular shoulder is formed being oriented towards said upper adapter;

first and second elastomeric packer cups, retained on the cup housing, including a substantially unrestricted self supporting lip portion for sealingly engaging said existing casing in said well bore during cementing operations to



cement said casing or tubing in said existing casing, said first and second packer cups including a base portion, opposite said lip portion, having an exterior end thereof, such that the exterior end of said first packer cup abuts said first annular shoulder and the exterior end of said second packer cup abuts said third annular shoulder, said first and third annular shoulders thereby providing support to said first and second packer cups respectively;

annular reinforcement means, embedded within said base portion, for providing reinforcing annular support to said packer cups by rigidly retaining said base portion adjacent said cup housing; and

a landing nipple secured within the upper adapter.

4,961,466

METHOD FOR EFFECTING CONTROLLED BREAK IN POLYSACCHARIDE GELS

Ronald E. Himes, Rush Springs, and John A. Knox, Duncan, both of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jan. 23, 1989, Ser. No. 299,699

Int. Cl.[5] E21B *43/26*

U.S. Cl. 166—250 **9 Claims**

1. A method of breaking a viscosified fluid introduced into a subterranean formation penetrated by a well bore comprising:

(a) determining the temperature of the subterranean formation;

(b) selecting a solid particulate of a condensation product of hydroxyacetic acid with up to 15 wt % cocondensing compounds containing other hydroxy-, hydroxycarboxylic-acid or carboxylic-acid moieties, the condensation product having a number average molecular weight in the range of from 200 to about 400, being substantially crystalline at the temperature of the formation and having a melting point above about 100° C. and being sufficiently

insoluble in the viscosified fluid at ambient temperature and degradable int ht epresence of an aqueous fluid at the temperature of the formation to form compounds capable of breaking a viscosified fluid;

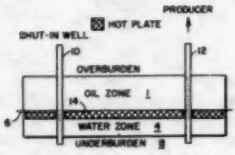
(c) dispersing a sufficient amount of the condensation product of step (b) into a viscosified fluid whereby breaking of the viscosified fluid can be achieved upon placement int he subterranean formation, said sufficient amount comprising from about 10 to about 200 pounds per 1000 gallons of said viscosified fluid; and

(d) placing the viscosified fluid containing the solid particulate condensation product of step (b) into a subterranean formation whereupon said product degrades and breaking of the viscosified fluid occurs.

4,961,467
ENHANCED OIL RECOVERY FOR OIL RESERVOIR UNDERLAIN BY WATER

Farrokh N. Pebdani, Coppell, Tex., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Nov. 16, 1989, Ser. No. 437,063
Int. Cl.[5] E21B *43/24, 43/243*
U.S. Cl. 166—261 **6 Claims**



1. A method for recovering oil from a subterranean, viscous oil-containing formation underlain by a water stratum at an oil/water contact, said petroleum formation being penetrated by at least one injection well and at least one spaced apart production well which penetrate the water stratum by a distance equal to at least 10% of the thickness of the oil-containing zone comprising:

(a) establishing fluid communication between the injection well and the bottom 15 to 25% of the oil-containing zone and a similar distance into the water stratum;

(b) establishing fluid communication between the production well and substantially the full thickness of the oil-containing zone plus a distance into the top of the water stratum equal to about 5% of the thickness of the oil-containing zone;

(c) injecting steam via the injection well into the formation at about the level of said oil/water contact and recovering oil from the formation via said production well until steam breakthrough occurs at the production well;

(d) shutting-in the production well and injecting a combustion-supporting gas into said injection well to establish an in-situ combustion reaction in said formation at about the level of said oil/water contact;

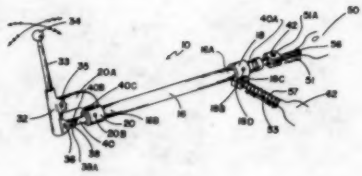
(e) continuing injecting combustion-supporting gas into the formation until the formation is pressurized to a predetermined level; and

(f) shutting-in the injection well and recovering oil from the formation via the production well.

4,961,468
MULTI-FUNCTION CONTROL ACTUATING MECHANISM

James M. Crowell, Providence, Ky., assignor to Pyro Mining Company, Sturgis, Ky.

Filed Aug. 8, 1989, Ser. No. 390,780
Int. Cl.[5] E21B *15/04*
U.S. Cl. 173—39 **10 Claims**



1. A multi-function control actuating mechanism for a roof drilling and bolting machine comprising:

an actuating rod having a first end and a second end, said actuating rod being of a predetermined length and being mounted for movement in a longitudinal direction;

a sleeve having a first end and a second end, said sleeve being mounted for limited rotational movement and being positioned around said actuating rod and extending along a portion of the length thereof;

first bracket means being secured adjacent to a first end of said sleeve;

second bracket means being secured adjacent to a second end of said sleeve; and

an actuating lever operatively connected to said second bracket and to a second end of said actuating rod;

wherein selectively imparting movement in a first direction to said actuating lever imparts longitudinal movement to said actuating rod and selectively imparting movement in a directional orthogonal to said first direction imparts limited rotational movement to said second bracket mean, said sleeve and said first bracket means for providing a multi-function control actuating mechanism for a roof drilling and bolting machine.

4,961,469
DRILL STRING ELEMENT

Kenneth L. Larsson, and Sven P. Liljebrand, both of Sandviken, Sweden, assignors to Sandvik AB, Sandviken, Sweden

Filed Apr. 24, 1989, Ser. No. 341,819
Claims priority, application Sweden, Apr. 26, 1988, 8801535
Int. Cl.[5] E21B *3/00*
U.S. Cl. 173—163 **9 Claims**

1. A drill string element adapted to be connected to similar drill string elements for forming a drill string to be used in top hammer percussive drilling, said drill string element comprising a tube assembly and impact-transmitting rod means disposed within said tube assembly, said tube assembly being adapted to transmit rotary motion to a drill bit in a drill string and said impact-transmitting rod means being adapted to transmit percussive impact energy to the drill bit,

said tube assembly comprising at least first and second coaxial tubular members threaded together in end-to-end relationship by a first type of screw thread, said tubular members defining axially opposite first and second ends, respectively, of said tube assembly, said first end of said tube assembly carrying a male section of a second type of screw thread, said second end of said tube assembly carrying a female section of said second type of screw thread, said tube assembly including internal surface means forming an inner space, said internal surface means forming first and second restrictions of reduced cross section situated adjacent to and spaced axially inwardly of said first and second ends, respectively, of said tube assembly,

said impact-transmitting rod means being freely slidably disposed within said space and arranged coaxially with said tube assembly, said impact-transmitting rod means including axially opposite first and second ends situated axially outwardly of said first and second restrictions, respectively, said impact-transmitting rod means including first and second radial abutments situated adjacent to and axially inwardly of said first and second restrictions, respectively,

said first and second restrictions being sized to engage said first and second radial abutments, respectively, to prevent axial passage of said impact-transmitting rod means, whereby said rod means is removable from said tubular members only upon unscrewing of said tubular members from one another,

said first type of screw thread being of a type which is harder to unscrew than said second type of screw thread.

4,961,470

WEIGH BED HAVING VERTICAL LOAD LINK

Clement J. Koerber, Sr., Batesville, Ind., assignor to Hill-Rom Company, Inc., Batesville, Ind.

Filed May 25, 1989, Ser. No. 356,462

Int. Cl.[5] G01G *19/52, 3/14;* A47C *19/00;* A61G *7/06*

U.S. Cl. 177—144 **7 Claims**

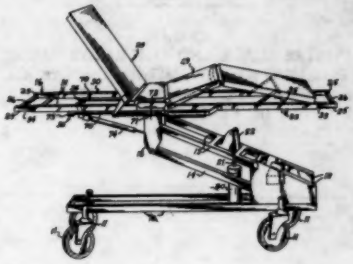
1. In a weigh bed,

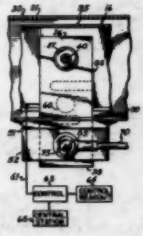
a support frame,

a weigh frame adjacent said support frame,

a vertical load link near each corner of said weigh frame and having strain gauges mounted thereon,

spherical bearings connecting said link to said support frame and said weigh frame, respectively, thereby assuring that all the weight of said weigh frame will be applied to said





link uni-axially, without error regardless of the angle of inclination of said support frame.

4,961,471

POST HOLE DIGGER

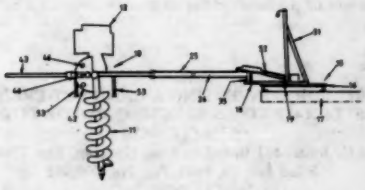
Ronald K. Ovens, 2 North Street, Beckenham, Western Australia, Australia

Filed Jul. 17, 1989, Ser. No. 380,889'

Claims priority, application Australia, Jul. 21, 1988, PI9395

Int. Cl.[5] E21B *7/02, 3/02*

U.S. Cl. 175—170 **6 Claims**



1. A post hole digger comprising a support base adapted to be mounted on a vehicle for a pivotal movement about a vertical axis, a post hole digging auger and motor assembly, an elongated support structure pivotally connected at one end to said support base about a horizontal axis, said auger and motor assembly being pivotally connected to the other end of said elongated support structure about a horizontal axis, said elongated support structure being extendible or retractable to enable positioning of said auger and motor assembly at a desired location and to adjust as the auger and motor assembly lowers and penetrates the ground, said auger and motor assembly being suspended from said elongated support structure so that in a free state the auger and motor assembly is suspended substantially vertically, and control handle means adapted to

be manually gripped to guide said auger and motor assembly and resist lateral forces occurring during operation of the auger and motor assembly.

4,961,472

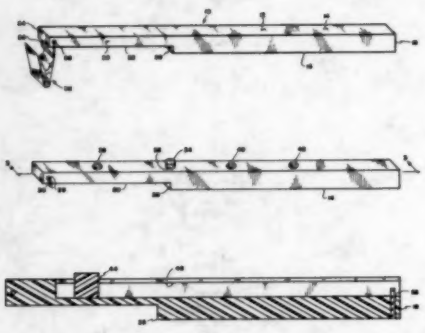
POSTAL SCALE AND THICKNESS GAUGE

Otis L. Pratt, 4230 Windsor Rd. South, Theodore, Ala. 36582

Filed Jul. 10, 1989, Ser. No. 377,126

Int. Cl.[5] G01G *1/02, 1/18*

U.S. Cl. 177—216 **8 Claims**



1. A postal scale device for determining whether the weight of a letter exceeds a predetermined amount comprising:

an elongated block having along its length a thicker portion adjacent one end and a thinner portion adjacent the other end, each of said portions including a flat bottom surface defining a plane parallel to the surface of the other portion;

said bottom surface of the thicker portion at its juncture with the thinner portion terminating in a transverse fulcrum edge perpendicular to the length of the beam;

letter clamping means fixedly secured to the thinner portion of the beam at or near the outer end thereof; and

the relative size and weights of the thicker and thinner regions being selected to provide for pivotal downward movement of said thinner end around said edge fulcrum when the beam is placed on a flat level surface with the thinner end extending past an edge thereof and when the weight of the letter clamped thereto exceeds a predetermined amount.

4,961,473

KIT FOR CONVERTING A HAND-POWERED WHEELCHAIR TO AN ELECTRIC MOTOR-POWER WHEELCHAIR

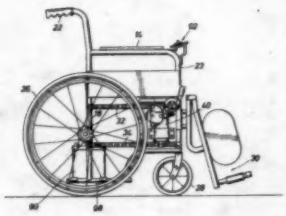
George C. Jones, 431 Branding Iron, Houston, Tex. 77060

Filed Jan. 30, 1989, Ser. No. 302,905

Int. Cl.[5] B60K *1/02*

U.S. Cl. 180—65.1 **7 Claims**

1. A kit for converting a hand-powered wheelchair to an electric motor-powered wheelchair, said wheelchair having a seat, a supporting frame for the seat including a pair of spaced, generally vertical, frame members on each side of the seat, a pair of large diameter wheels supporting the rear of the frame, and a pair of small diameter wheels supporting the front of the frame, said small diameter wheels being connected to the frame for pivotal movement relative to the frame around a vertical axis to allow the direction of travel of the chair to be changed, said kit comprising a pair of DC electric motors, each motor having an output shaft and a drive wheel mounted on the output shaft, means for mounting each electric motor on the supporting frame for pivotal movement relative to the frame between a first position with the drive wheel adjacent to but spaced from a rim of one of the large diameter wheels and a second position with the drive wheel in engagement with a rim of the wheel so that rotation of the drive wheel will rotate the large wheel, said means for mounting each motor includes two mounting bars and means for attaching the mounting bars in spaced parallel position between the vertical frame members, and a motor support member for attaching to the mounting bars to support a motor and a drive wheel, a pair of handles for mounting on the frame for pivotal movement around fixed axes, said handles having portions extending upwardly from



the axes of rotation to be manually engaged for rotating the handles about their axes of rotation and lower portions extending downwardly from the axes, and link means for connecting to the lower portion of each handle and to a motor for moving the motor between the first and second positions with the handle and for holding the motors in the second position until moved therefrom by the handle, a battery tray for mounting on the frame to support a storage battery, and switch means for controlling the flow of electricity to the motors when the motors are in the second position to cause the wheelchair to move.

4,961,474

STEERING ANGLE MIDDLE POINT DETECTING APPARATUS

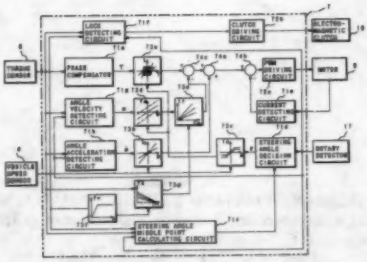
Toshihiko Daido; Hirofumi Matsuoka, and Hidetoshi Tabuse, all of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Jul. 10, 1989, Ser. No. 377,867

Claims priority, application Japan, Jul. 11, 1988, 63-173364; Sep. 30, 1988, 63-248309; Jan. 25, 1989, 1-15696; Apr. 7, 1989, 1-88258

Int. Cl.[5] B62D *5/00*

U.S. Cl. 180—79.1 **3 Claims**



1. An apparatus for detecting a steering angle middle point of a steering mechanism for converting rotations of a steering wheel to motion in right and left direction for steering a vehicle, comprising:

a vehicle speed detecting means for detecting a vehicle speed of said vehicle;

a torque sensor for detecting steering torque exerted on said steering wheel at regular intervals;

a steering position detecting means for detecting a steering position of said steering mechanism;

a means for comparing a steering torque set value previously set according to said vehicle speed with a steering torque detected by said torque sensor; and

a steering angle middle point calculating means for calculating a middle point of said steering angle by using the steering position of the steering mechanism detected by said steering position detecting means, when said detected steering t -que is smaller than said steering torque set value.

4,961,475

CRUISE CONTROL SYSTEM

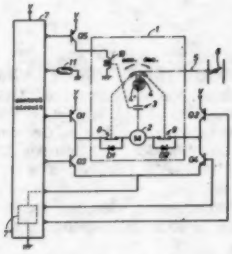
Norimitsu Kurihara; Masahiko Asakura; Hidehiko Anzai, all of Saitama, and Mitsuru Matsui, Gunma, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha and Mitsuba Electric Manufacturing Co., Ltd., both of, Japan

Filed Mar. 10, 1989, Ser. No. 322,321

Claims priority, application Japan, Mar. 11, 1988, 63-57820; Mar. 11, 1988, 63-57821

Int. Cl.[5] B60K *31/04*

U.S. Cl. 180—179 **5 Claims**



1. A cruise control system for maintaining the cruising speed of a vehicle at a set speed, comprising:

means for detecting the speed of the vehicle;

control means for providing an acceleration and deceleration signal according to a speed signal supplied from said speed detecting means;

an electric motor having an output shaft which rotates in either of two directions according to said acceleration and deceleration signal provided from said control means;

a speed control member coupled to said output shaft of said motor for increasing and decreasing the speed of the vehicle by acting upon a part of the vehicle according to the direction of rotation of said output shaft of said motor;

return spring means for urging said speed control member in a direction to decelerate the vehicle; and

clutch means disposed between said output shaft and said speed control member for connecting said output shaft to said speed control member and adapted to be activated by said control means;

wherein said control means actuates said electric motor to accelerate or decelerate the vehicle to maintain the cruising speed of the vehicle at the set speed in response to the vehicle speed as detected by said speed detecting means being not higher than a first upper speed limit which is higher than said set speed by a predetermined amount, and disengages said clutch means in response to the vehicle speed as detected by said speed detecting means being higher than said first upper speed limit.

4,961,476

ARRANGEMENT FOR CONTROLLING THE POWER TRANSMISSION TO AT LEAST TWO AXLES OF A MOTOR VEHICLE

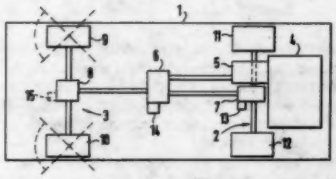
Lothar Witte, Vaihingen; Norbert Stelter, Weissach; Ulrich Appt; Rolf Geiger, both of Stuttgart, and Klaus-Gerhard Wolpert, Korntal-Münchingen and Stephan Lawitzki, Weissach-Flacht, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AC, Fed. Rep. of Germany

Filed Mar. 30, 1989, Ser. No. 330,762

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1988, 3811214

Int. Cl.[5] B60K *17/348*

U.S. Cl. 180—197 **35 Claims**



1. An arrangement for controlling the power transmission to at least two powered axles of a motor vehicle, having a controllable friction element for limiting rotational speed compensation between the axles;

a control apparatus for controlling the friction element, by a control element as a function of vehicle operating parameters sensed by sensors;

wherein the control apparatus includes;

means for determining a longitudinal speed difference between a rotational average speed of the wheels of a first powered axle and a rotational speed of the wheels of a second powered axle;

means for comparing the longitudinal speed difference with a speed-dependent first tolerance band defining positive maximum longitudinal wheel speed differences that will allow the vehicle wheels to run without any slip as well as run with an approximately identical wheel slip, and a speed-dependent second tolerance band defining negative maximum longitudinal wheel speed differences that will allow the vehicle wheels to run without any slip as well as run with an approximately identical slip;

wherein said control apparatus operates the control element in response to the comparison to increase the limiting of the rotational speed compensation when an upper limit of the first tolerance band is exceeded;

wherein said control apparatus operates in response to the comparison to increase the limiting of the rotational speed compensation when the comparison falls below a lower limit of the second tolerance bank;

wherein said control apparatus operates in response to the comparison to decrease the limiting of the rotational speed compensation when the comparison falls below a lower limit of the first tolerance band;

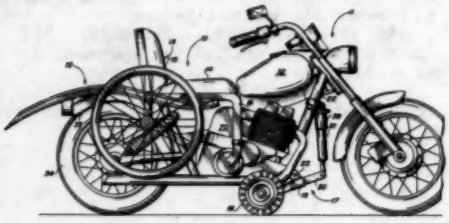
wherein said control apparatus operates in response to the comparison to decrease the limiting of the rotational speed compensation when the comparison exceeds an upper limit of the second tolerance band; and wherein at other times said control apparatus operates the control element in response to the comparison to maintain the limiting of the rotational speed compensation.

4,961,477

WHEEL CHAIR TRANSPORTER

John F. Sweeney, 1138 BCS #1, Phoenix, Ariz. 85027

Filed Jun. 8, 1988, Ser. No. 203,913
Int. Cl.[5] B60P 1/43; B62K 27/12
U.S. Cl. 180—219 7 Claims



1. A Wheelchair Transporter device for transferring a person confined to a wheelchair and said wheelchair, from ground level position by means of a glide track onto a motorcycle/-scooter two wheeled vehicle, stabilized by means of a support unit, for transportation, in conjunction comprising:

a two-wheeled vehicle;

a wheelchair having a frame supported by four (4) wheels, said frame constructed without obstruction beneath a seat area, enabling said wheelchair to straddle said vehicle, and a crossframe supported by said frame, said crossframe containing roller pins, roller supports and rollers, said rollers providing the means for coupling the wheelchair with a glide track;

a glide track coupled to said vehicle comprised of two elongated metal track-like tubing enclosures containing grooves and running parallel to each other and held apart by cross braces with a loading handle attached to one end of said glide track;

a support unit attached to said vehicle by a hinging bracket, said support unit having a frame with a tongue and supported by wheels mounted on axles to provide the means for ground stabilization of said vehicle;

a power unit coupling said support unit and said vehicle for raising said wheels from the ground; and

said means for coupling said wheelchair, with its occupant, to said glide track, enabling wheelchair, with its occupant to transfer from a ground level onto said vehicle, stabilized by said support unit, for the purpose of transportation.

4,961,478

CLAMPING DEVICE

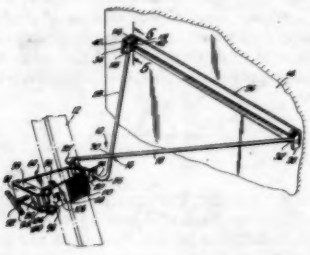
Carl Anderson, c/o Alum-A-Pole Corporation-2589 Richmond Ter., Staten Island, N.Y. 10303

Filed Mar. 21, 1989, Ser. No. 326,385
Int. Cl.[5] E04G 5/04
U.S. Cl. 182—229 25 Claims

1. In a combination of a brace for securing an upright pole to a support surface, with a clamping device for holding the pole,

said brace comprising frame means pivotally connected to said clamping device about two mutually perpendicular axes, and a connecting bar attachable to the support surface;

said clamping device comprising a substantially U-shaped yoke member having two opposite lateral portions and a bight portion, said yoke member receiving the upright pole, a clamp member pivotally connected to one of said lateral portions of said yoke member to pivot between an open position in which said pole is inserted into said yoke member and a closed position to clamp said pole in said yoke member, means for pressing said pole against said bight portion of said yoke member, and a locking member engageable in the other of said lateral portions of said yoke member for locking said clamp member in said closed position, said locking member being pivotable on said clamp member between an open position to release said clamp member and permit pivoting of said clamp member to said open position thereof and a locking position to reliably lock said clamp member to said yoke member in said closed position, said pressing means being



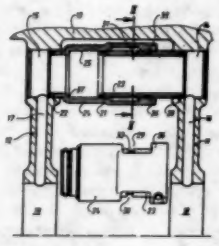
actuated externally of said yoke member to press said pole against said bight portion after said locking member has been pivoted into said locking position to securely engage the pole between said lateral portions, said bight portion and said pressing means and, at the same time, prevent any accidental release of said locking member from said yoke member.

4,961,479

DUCT FOR THE DISTRIBUTION OF LUBRICATING OIL

Michael Groddeck, Meckenbeuren, and Otto Reifenscheid, Friedrichshafen, both of Fed. Rep. of Germany, assignors to MTU Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/DE89/00058, § 371 Date Nov. 20, 1989, § 102(e) Date Nov. 20, 1989, PCT Pub. No. WO89/08182, PCT Pub. Date Sep. 8, 1989
PCT Filed Feb. 1, 1989, Ser. No. 427,838
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1988, 3805708
Int. Cl.[5] F01M 1/04
U.S. Cl. 184—6.5 5 Claims



1. A duct for the distribution of lubricating oil, which extends in longitudinal direction of a piston-operated internal-combustion engine through several transverse walls of the crankcase, and each duct section extending between two transverse walls being constructed of axially joined components which are sealed off with respect to one another and with respect to the bored transverse-wall passages which connect in the transverse walls, characterized in that the duct section extending between two transverse walls is composed of an insert pipe and of a socket pipe which, at least partially, receives the insert pipe in a socket in that the insert pipe and the socket pipe are constructed to be axially slidable with respect

to one another, in that the free ends of the insert pipe and of the socket pipe which are axially inserted into the bored transverse-wall passages of the assigned transverse walls, at the outer circumference, each have a radial groove for receiving a sealing ring, and in that the mouth of the socket is constructed as a clamp with a tensioning device supporting itself on the insert pipe.

4,961,480

PIN GUIDING AND/OR DAMPING SLEEVE FOR FLOATING-CALIPER SPOT-TYPE DISC BRAKES

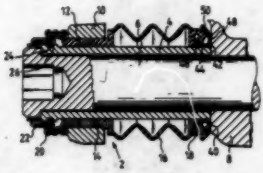
Rolf Weiler, Frankfurt am Main, and Wolfgang Endler, Hofheim, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 102,461, Sep. 29, 1987, Pat. No. 4,832,161. This application Oct. 12, 1988, Ser. No. 256,532

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1986, 3633337

Int. Cl.[5] F16D *65/00*

U.S. Cl. 188—73.44 **9 Claims**



1. A pin guiding and damping element for floating-caliper spot-type disc brakes used in automotive vehicles, said element comprising a generally cylindrical elastic guiding and damping portion adapted to be seated in a bore formed in the brake, the guiding and damping portion being formed at one end with a first pleated bellows portion and at the other end with a second pleated bellows portion, said guiding and damping portion being provided with radially outwardly extending flange portions at its opposite ends, each of said first and second pleated bellows portions being attached to the radially outermost part of its associated flange portion, and a rolling diaphragm portion formed adjacent the end of the second pleated bellows portion opposite the guiding and damping portion, said rolling diaphragm portion having a widened mounting rib, said mounting rib coming into position under said second pleated bellows portion and adjacent one of said flange portions when said rolling diaphragm portion is in a fully retracted position.

4,961,481

HYDRAULIC ACTUATION SYSTEM

Herbert J. Bartz, 2589 Puesta del Sol, Santa Barbara, Calif. 93105

Filed Jan. 3, 1989, Ser. No. 293,004

Int. Cl.[5] F16F *9/46*

U.S. Cl. 188—130 **6 Claims**

1. In a control system for a vehicle axle-to-frame shock absorber having friction elements that resist relative movement during shock absorption, the combination comprising:

(a) a fluid pressure responsive actuator operatively connected to the shock absorber to convert variations in fluid pressure to variations in mechanical loading acting to variably compress together the friction elements,

(b) a fluid pressure control unit having

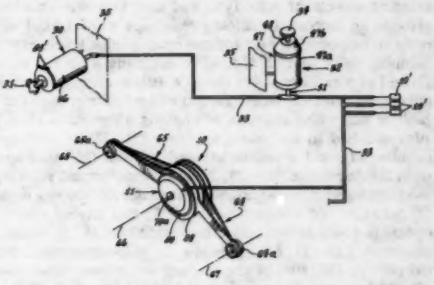
(i) a body defining a bore and a plunger movable in the bore, the body and plunger defining a fluid pressure chamber communicating with said actuator to supply said fluid pressure variations thereto, said body being provided with a fluid pressure bleed means operatively connected with said chamber,

(ii) a rotary manual control, and

(iii) a stem connected with the manual control and the plunger the stem having threaded connection with the body to advance and retract the plunger as the manual control is rotated forwardly and rearwardly,

(c) a hydraulic line fluidly connecting said pressure control unit with said actuator,

(d) fluid supply means operatively connected with said chamber, said fluid supply means including a fluid reservoir, and



(e) a manually operable pump located in said reservoir to displace fluid from the reservoir through the pump to said hydraulic line in response to operation of the pump,

the pump including a tube in the reservoir and having a side opening to communicate fluid between the reservoir and the tube interior, a second opening having a check valve operative therein, and a pump plunger reciprocable in the tube to draw fluid into the interior, as the plunger is retracted, and to displace fluid from the tube interior past the check valve and into the line, as the plunger is advanced.

4,961,482

OSCILLATION DAMPER

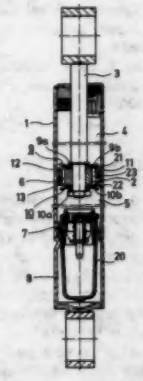
Hans Pohlenz, Boppard, and Günter Wagner, Nörtershausen, both of Fed. Rep. of Germany, assignors to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

Filed Apr. 17, 1989, Ser. No. 339,141

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1988, 3813402

Int. Cl.[5] F16F *9/348*

U.S. Cl. 188—280 **11 Claims**



1. An oscillation damper comprising a cylinder member

having an axis and defining a cavity (4, 5, 8) therein, and further comprising a piston rod member (3) axially movable with respect to said cylinder member (1) inwards and outwards of said cavity (4, 5, 8), at least two compartments (4, 5) being provided within said cavity (4, 5, 8), said compartments (4, 5) containing a damping liquid and being interconnected by a damping valve unit (2, 6, 9, 10), throttled flow of liquid occurring through said damping valve unit (2, 6, 9, 10) as a response to axial movement of said piston rod member (3) with respect to said cylinder member (1), the throttling effect of said damping valve unit (2, 6, 9, 10) being increased in response to increasing movement velocity of said axial movement such as to provide an increased damping resistance to said axial movement in response to said increasing movement velocity, said damping valve unit (2, 6, 9, 10) comprising a carrier member (2) and two resilient valve discs (9, 10), overlying two axially oppositely directed faces (21, 22) of said carrier member (2), each of said valve discs (9, 10) having a central portion (9a, 10a) attached to the respective face (21, 22) of said carrier member (2), and a circumferential portion (9b, 10b) spaced from the respective face (21, 22) at zero movement velocity, at least one valve bore (6) extending through said carrier member (2) between said compartments (4, 5) and having respective openings towards respective compartments (4, 5) within the respective face (21, 22) and below the respective circumferential portion (9b, 10b) of the respective resilient valve disc (9, 10), wedge-shaped circumferential gaps being defined at zero velocity between the respective face (21, 22) and the respective circumferential portion (9b, 10b) of the respective resilient valve discs (9, 10), said wedge-shaped circumferential gaps being in communication with each other through said at least one valve bore (6) and with the respective compartment (4, 5) at zero movement velocity, said communication being at least partially closed at increasing movement velocity by the respective circumferential portion (9b, 10b) approaching the respective face (21, 22) in response to increasing liquid flow velocity between said compartments (4, 5), said circumferential portion (9b, 10b) of each one of said resilient valve discs (9, 10) being biased towards its zero movement velocity position by at least one support pin (11) movably accommodated by a respective guide bore (23) through said carrier member (2), said support pin (11) being longer than the distance between said faces (21, 22) and engaging both valve discs (9, 10), said at least one valve bore (6) being free of axial support-means for said resilient valve discs (9, 10), said at least one guide bore (23) being substantially closed for liquid flow by said support pin (11).

4,961,483

VARIABLE DAMPING CHARACTERISTICS SHOCK ABSORBER WITH FEATURE OF GENERATION OF PISTON STROKE DIRECTION INDICATIVE SIGNAL

Fumiyuki Yamaoka; Shinobu Kakizaki, and Shigeru Kikushima, all of Kanagawa, Japan, assignors to Atsugi Motor Parts, Limited, Tokyo, Japan

Filed Aug. 1, 1989, Ser. No. 388,006

Claims priority, application Japan, Aug. 3, 1988, 63-195154; Aug. 3, 1988, 63-103606[U]

Int. Cl.[5] F16F *9/50*

U.S. Cl. 188—299 **10 Claims**

1. A variable damping characteristics shock absorber comprising:

a hollow cylinder defining therein an internal space;

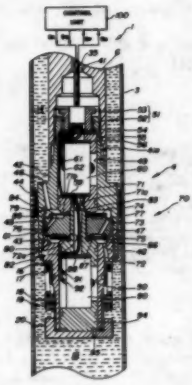
a piston assembly disposed within said internal space of said cylinder for defining first and second working chambers;

a communication path means, incorporated in said piston assembly, for communicating said first and second working chambers, said communication means including a first path active during piston bounding stroke for establishing fluid communication between said first and second working chambers and a second path active during piston rebounding stroke for establishing fluid communication between said first and second working chambers;

a first valve means associated with said first path, responsive to pressure difference between said first and second working chambers during piston bounding stroke, for forming a controlled area of a first fluid flow gap, which area of said first fluid flow gap being variable depending upon the magnitude of pressure difference between said first and second working chambers;

a second valve means associated with said second path, responsive to pressure difference between said second and second working chambers during piston rebounding stroke, for forming a controlled area of a second fluid flow gap, which area of said second fluid flow gap being variable depending upon the magnitude of pressure difference between said first and second working chambers;

a first piezoelectric element associated with said first valve means, for varying valve characteristics of said first valve, said first piezoelectric element being responsive to said



pressure difference to produce a first pressure indicative signal having a first value which is variable depending upon the piston stroke direction;

a second piezoelectric element associated with said second valve means, for varying valve characteristics of said second valve, said second piezoelectric element being responsive to said pressure difference to produce a second pressure indicative signal having a second value which is variable depending upon the piston stroke direction; and

a control means, responsive to said first and second pressure indicative signals for discriminating piston stroke direction on the basis thereof and generating first and second control signals to be supplied to said first and second piezoelectric elements for obtaining desired damping characteristics depending upon piston stroke directions.

4,961,484

BRAKE DEVICE FOR VEHICLE

Yoshio Kato, Takatsuki, and Ichiro Kawashima, Akashi, both of Japan, assignors to Kabushiki Kaisha Kobe Sieko Sho, Kobe, Japan

Filed Apr. 19, 1989, Ser. No. 340,547

Claims priority, application Japan, Apr. 22, 1988, 63-101152; Mar. 9, 1989, 1-57567

Int. Cl.[5] F16D *33/00*; B60K *41/28*

U.S. Cl. 192—3.31 **4 Claims**

1. In a vehicle having a diesel engine, a transmission shiftable with a shift lever, a torque converter having a lockup clutch connected between said engine and said transmission, an engine exhaust brake and a service brake, a brake device comprising:

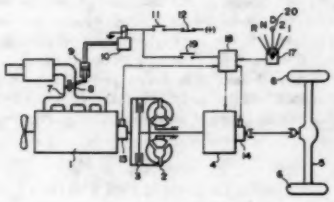
engine speed detecting means;

vehicle speed detecting means;

shift lever position detecting means;

means for detecting operation of said engine exhaust brake; and

control means comprising means for receiving signals from said engine speed detecting means, from said vehicle speed detecting means, from said shift lever position detecting means and from said engine exhaust brake operation detecting means, means for disengaging said lockup clutch when the detected vehicle speed is lower than a



low speed set value of an effective vehicle speed corresponding to the detected shift lever position and said engine exhaust brake is operated, means for engaging said lockup clutch when the detected vehicle speed is in a range between said low speed set value and a high speed set value of said effective vehicle speed, and means for disengaging said lockup clutch and down shifting said transmission by one gear range when the detected vehicle speed exceeds said high speed set value.

4,961,485

OIL CIRCULATION IN WHEEL HEAD TRANSMISSION

Martin Huff, Tettnang, and Ulrich L. Kuchelmeister, Friedrichshafen, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Fed. Rep. of Germany

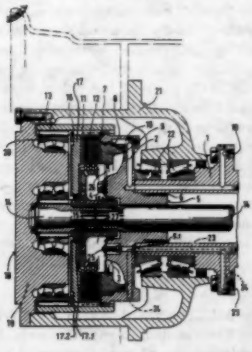
PCT No. PCT/EP87/00557, § 371 Date Mar. 28, 1990, § 102(e) Date Mar. 28, 1990, PCT Pub. No. WO88/02450, PCT Pub. Date Apr. 7, 1988

PCT Filed Sep. 29, 1987, Ser. No. 346,832

Claims priority, application Luxembourg, Sep. 30, 1986, 00561

Int. Cl.[5] F16D *65/853;* B60T *1/06*

U.S. Cl. 192—4 A **5 Claims**



1. A drive wheel having a housing (21) designed as wheel hub and a wheel-head cover (18), designed as planetary carrier, having planetary gears (20) supported thereon which mesh with a sun gear driven by a rotatable half-shaft (14) and a ring gear (13) connected via a ring-gear carrier (2) with an axle pipe (1), and said housing (21) being supported by bearing means (22),

said drive wheel having a liquid-cooled fluid-actuatable disc brake (11, 12) with external brake discs (11) being non-rotationally connected with said ring gear (13) and internal discs (12) being non-rotationally connected, via a brake disc carrier (15), with said half-shaft (14), said brake-disc carrier (15) having an collecting annular space (27) and radial bores situated in an external rim thereof, and an annular piston (9) of the disc brake being inserted in an external hub collar (7) of said ring-gear carrier (2) and forming therewith a brake annular piston which can be activated by fluid provided via a fluid pipe (10) in said ring-gear carrier (2) and in said axle pipe (1),

characterized in that a coolant feedpipe (23) and a coolant drain pipe (24) pass through a bore of said bearing means (22) in the wall of said axle pipe (1) separately from said fluid pipe (10), said collecting annular space (27) has a pocket-like cross section and said coolant feedpipe (23) is located, on a transmission side, in an internal hub collar (3) of said ring-gear carrier (2) and discharges coolant on a side of said axle pipe (1) radially beneath said brake discs (11, 12) in a manner such that said coolant flows from said coolant feedpipe (23) into said collecting annular space (27), and cover means (25) closes coolant flow through said coolant feedpipe (23) when said brake (11, 12) is disengaged, but said cover means (25) is axially movable by said brake annular piston (9) to open the flow of coolant through said coolant feedpipe (23) when said brake (11, 12) is engaged.

4,961,486

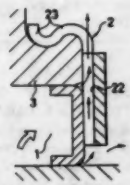
RETAINER PLATE OF A ONE-WAY CLUTCH ASSEMBLY

Yoshio Kinoshita, Ayase; Shigeaki Koshino, Ohiso, and Yoshiaki Sakai, Fujisawa, all of Japan, assignors to NSK-Warner Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1988, Ser. No. 247,468

Int. Cl.[5] F16B *13/58*

U.S. Cl. 192—41 R **10 Claims**



1. A retainer plate for retaining a one-way clutch assembly axially in position between a pair of inner and outer rings, and retainer plate being generally ring-shaped and provided with at least one surface extending radially from an inner periphery to an outer periphery, said surface being provided with at least one recessed portion on each side of said plate with respect to a remaining portion of said surface on each of said sides, said recessed portions defining a plurality of flow passages extending radially of said plate, to thereby prevent said recessed portion on one side of said plate from being brought into contact with a contact surface when said remaining portion of said surface on said one side of said plate is brought into contact with said contact surface such that a lubricant can flow through said flow passages.

4,961,487

VIBRATION DAMPING APPARATUS

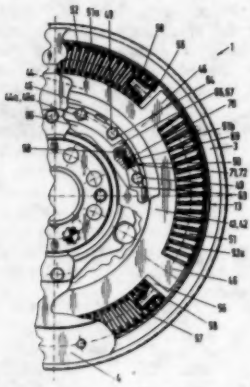
Hermann Langeneckert, Appenweier, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Mar. 27, 1989, Ser. No. 328,925

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1988, 3810433

Int. Cl.[5] F16D *3/66*

U.S. Cl. 192—106.2 23 Claims



1. Apparatus for damping vibrations in the power train between an engine and an input component of a transmission in a motor vehicle, comprising a first flywheel connectable with the engine; a second flywheel connectable with the input component, particularly by way of a friction clutch, said flywheels being angularly movable relative to each other; and vibration damping means operating between said flywheels and comprising at least energy storing means arranged to store energy in response to angular movement of at least one of said flywheels relative to the other of said flywheels, an input element, an output element, and plug-in means for non-rotatably but axially movably coupling one of said elements with one of said flywheels, said coupling means including first profiles, second profiles adjacent said first profiles, and means for bracing said first and second profiles against each other in the circumferential direction of said flywheels.

4,961,488

DEVICE FOR TRANSFERRING OBJECTS FROM A SUPPLY DEVICE TO A TAKE UP DEVICE

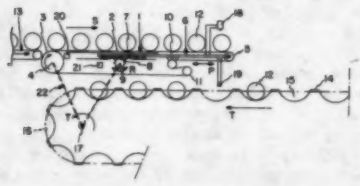
Mathijs Steeghs, Panningen, Netherlands, assignor to Werner & Pfleiderer-Hatoa B.V., Panningen, Netherlands

Filed Jun. 9, 1989, Ser. No. 363,976

Claims priority, application Netherlands, Jun. 15, 1988, 8801525

Int. Cl.[5] B65G *47/26*

U.S. Cl. 198—357 5 Claims



1. Device for transferring objects from a supply device, by which the objects are irregularly delivered, to a take up device having a take up conveyor provided with take up members, said transferring device comprising:

an endless transfer conveyor; and

a sensor disposed near a discharge end of the transfer conveyor to detect an object present near said discharge end;

wherein said discharge end of the transferring conveyor is positioned on a slide, the slide being movable back and forth along a conveying direction of the transfer conveyor, said discharge end being positioned above the take up conveyor, which take up conveyor moves in a direction opposite to the conveying direction the transfer conveyor, the sensor for detecting an object being mounted to the slide and said slide being provided with a second sensor to detect the spot of the take up conveyor where an object can be brought onto said take up conveyor.

4,961,489

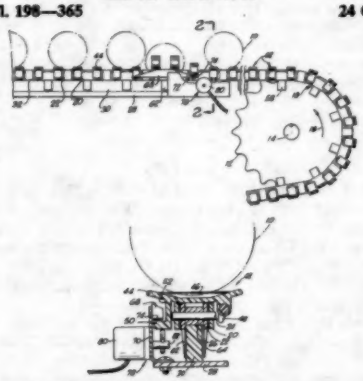
PRODUCT HANDLING SYSTEM

Aaron J. Warkentin, Orange Cove, Calif., assignor to MAF Industries, Inc., Traver, Calif.

Filed Jul. 18, 1983, Ser. No. 515,313

Int. Cl.[5] B65G *43/00*

U.S. Cl. 198—365 24 Claims



2. A product handling system, comprising

a conveyor having a conveying path and an elongate, endless flexible member extending along said conveying path;

rocker elements pivotally mounted about an axis parallel to said conveying path on said member to form an elongate conveying support along said conveying path; and

means for selectively pivoting individual ones of said rocker elements and holding more than one adjacent said rocker element at a time in the pivoted condition to tip a portion of said conveying support, said means including a ramp positioned adjacent said conveying path and a selectively movable actuator adjacent said conveying path at one end of said ramp, said rocker elements each including a protrusion, said actuator being selectively positionable to move a said protrusion into engagement with said ramp.

4,961,490

TRANSFER MECHANISM WITH JAM DETECTOR

Frank D. Risko, Livonia, and Thomas D. Lewis, Highland, both of Mich., assignors to Elopak Systems A.G., Glattbrugg, Switzerland

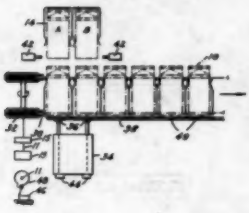
Continuation-in-part of Ser. No. 851,184, Apr. 14, 1986, abandoned. This application Feb. 22, 1988, Ser. No. 158,617

Int. Cl.[5] B65G *47/36*

U.S. Cl. 198—433 3 Claims

1. A transfer mechanism comprising vacuum actuated transfer means including means for utilizing vacuum for engaging and transferring at least one carton from one processing unit to an indexing conveyor, photoelectric means for detecting the

presence of said at least one carton in said one processing unit, vacuum sensors operatively connected to said transfer means for detecting the increase in vacuum once the transfer means has engaged said at least one carton, and strobe means for producing a signal which occurs concurrently with the vacuum sensor's detection of the increase in vacuum, and ends when the photoelectric means detects the absence of said at least one carton, and otherwise serving to note whether either of the cooperating photoelectric and vacuum sensing signals is detected and then lost or is not detected prior to the end of the strobe signal, to thereby stop the transfer mechanism should either occur;



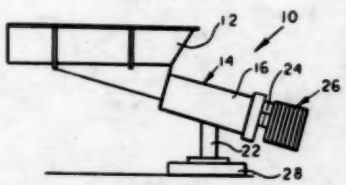
and a control system including conventional logic circuitry adapted to receive inputs from said photoelectric means and said vacuum sensors, wherein said strobe means includes a shaft operatively connected to said indexing conveyor and adapted to rotate once for each index of the conveyor, a cam mounted on said shaft for rotation therewith, and a limit switch operatively connected to said cam for signalling said conventional logic circuitry so as to stop said transfer mechanism in the event either of said inputs is not detected.

4,961,491

THREE MASS VIBRATORY FEEDER

Thomas H. Falconer, Erie, Pa., assignor to Eriez Manufacturing Company, Erie, Pa.

Filed Sep. 13, 1989, Ser. No. 406,963
Int. Cl.[5] B65G *27/24*
U.S. Cl. 198—761 **15 Claims**



1. A feeder with a tray comprising a first mass and a base including a drive means,

said base comprising a second mass,

a tuning weight having a third mass,

a first spring means having a first spring constant connecting said tray to said base,

a second spring means having a second spring constant connecting said base to said tuning weight,

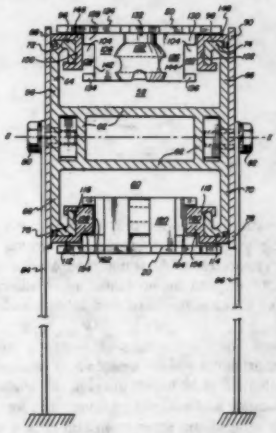
said drive means being fixed to said base and operatively associated with said tray for applying a force of alternating direction and predetermined frequency to said tray whereby said tray vibrates relative to said base and said base remains substantially in a fixed position.

4,961,492

ARTICLE CARRYING CONVEYOR AND WEARSTRIP SET THEREFOR

John A. Wiseman, and James F. Murphy, both of Lynchburg, Va., assignors to Simplimatic Engineering Company, Lynchburg, Va.

Filed Jul. 22, 1988, Ser. No. 222,970
Int. Cl.[5] B65G *15/60*
U.S. Cl. 198—841 **15 Claims**



1. A conveyor beam system for use with an article carrying chain, said beam system comprising:

(a) at least one conveyor beam of substantially rectangle shaped cross section having a first side forming at least one pair of opposed guide rails in said first side thereof, said rails having outer surfaces for supporting said chain and opposed inner edges separated by an open gap to form a raceway therebetween for receiving said chain, said raceway being open to said one side, said conveyor beam being formable into predetermined lengths, each said length being further formable into desired curved shapes, said lengths of said beam being assemblable into a conveyor path along which articles can be conveyed by moving said chain mounted in said raceway, said first side of said beam corresponding to a first side of said rectangle having said raceway formed therein, said beam having a cross-section substantially symmetrical about an axis through said cross-section that is substantially parallel to said first side, said beam having a second raceway formed in the opposite side of said beam that corresponds to the opposite side of said rectangle, both first and second raceways being adapted to have either a wearstrip means or a modified wearstrip means affixed thereto; and

(b) a said wearstrip means for covering part of said guide rails to cover at least a portion of said outer surfaces and opposed inner edges, said wearstrip having a shape and being dimensioned so that the chain can be relatively freely removed from said raceway in a direction generally transverse to the path of said conveyor, whereby sections of said conveyor path are configured to permit said chain to be freely lifted out of said raceway; and

(c) said modified wearstrip means having a modified shape and dimension to lockingly engage said chain in said raceway to retain said chain in said raceway in a direction transverse to said raceway,

whereby said wearstrip means can be affixed to said beam to establish sections of said path where said chain can be freely lifted out and said modified wearstrip means can be affixed to said beam to establish sections of said path where said chain is lockingly engaged in said raceway.

4,961,493

AROMATIC PACKAGE

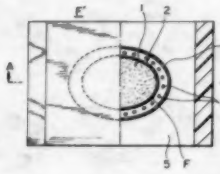
Noboru Kaihatsu, Ohsaka, Japan, assignor to Nisshinbo Industries, Inc., Nihonbashi, Japan

Filed Dec. 13, 1989, Ser. No. 449,761

Claims priority, application Japan, Dec. 27, 1988, 63-167635[U]

Int. Cl.[5] F17G *13/00*; B65D *85/00*

U.S. Cl. 206—0.5 6 Claims



1. An aromatic package for creating an aroma comprising:

an aromatic substance for creating an aroma as said substance evaporates, said aromatic substance comprising a liquid solvent, and an aromatic agent dissolved in said solvent so that a solution of said solvent and said agent is formed;

a sealed sack for containing said aromatic substance, said sack comprising a gas-permeable and liquid-impermeable polyurethane film 30 to 500 microns thick adapted to hold said substance and sealed to prevent the loss of said substance in nongaseous form from said sack when said sack is held in any position, while allowing the aroma created by said substance to permeate through said film; and

a case for holding said sack containing said aromatic substance, said case having a multiplicity of pores so that the aroma permeating through said film is released from said case.

4,961,494

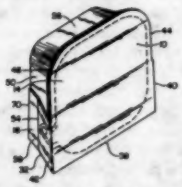
STAND ON END TRAY CONTAINER

Garold W. Alexander, Powell, Ohio, assignor to Pressware International, Inc., Columbus, Ohio

Filed Nov. 13, 1989, Ser. No. 434,268

Int. Cl.[5] B65D *5/52*

U.S. Cl. 206—45.2 10 Claims



1. In a container comprising a lid removably attached to a tray having a bottom panel and side walls, the improvement comprising:

a pair of side panels attached to and extending from opposite sides of the lid and folded toward the bottom panel of the tray, an end of each side panel extending beyond an interposed tray side wall for supporting the container on a support surface with the tray and its attached lid in a generally vertical orientation.

4,961,495

PLASTIC CONTAINER HAVING AN EASY-TO-PEEL SEAL FORMING COMPARTMENTS

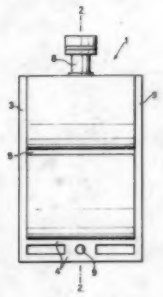
Takao Yoshida, Tama, and Tatsuo Suzuki, Machida, both of Japan, assignors to Material Engineering Technology Laboratory, Incorporated, Tokyo, Japan

Filed Jun. 9, 1989, Ser. No. 363,775

Claims priority, application Japan, Jun. 10, 1988, 63-143399

Int. Cl.[5] B65D *30/02*

U.S. Cl. 206—219 6 Claims



1. In a filled container including a container made of a polyolefin resin and defining a plurality of compartments isolated from one another by at least one seal as a means of isolation, said seal having easy-to-peel openability, and contents filled separately in the respective compartments, whereby upon use of the filled container the contents can be mixed together without exposure to the surrounding atmosphere by breaking the isolation means from the outside and communicating the compartments to one another, the improvement wherein a resin taking part in direct bonding of at least one portion of a peripheral seal hermetically sealing a sheet or sheets of a main body of the container is the same as a resin taking part in direct bonding of the isolation means, and the resin taking part in the direct bondings is a resin mixture composed of at least two polyolefin resins of the resin mixture, wherein said first resin is a linear low-density polyethylene resin having a lower melting starting temperature in an amount of from 80 wt.% to 20 wt.%, and said second resin is a polypropylene resin having a melting starting temperature at least 8° C. higher in an amount of from 20 wt.% to 80 wt.%.

4,961,496

CIGARETTE PACK, ESPECIALLY HINGE-LID BOX

Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Nov. 22, 1989, Ser. No. 440,171

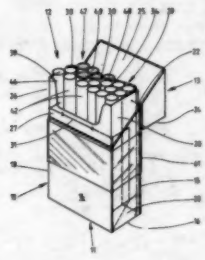
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1988, 3839553

Int. Cl.[5] B65D *25/06*, *85/10*

U.S. Cl. 206—246 8 Claims

1. A cigarette pack with a box, especially a hinge-lid box for a cigarette-group, comprising a deformable partition arranged in the box (10) and connected to the latter, said partition separating a cigarette compartment (46) from a waste compartment (47) for waste-cigarettes (48); wherein the partition comprises a rear-wall (30) of an inner blank (29) of a cigarette-group (12);

and wherein the rear wall (30) of the inner blank (29) extends from a bottom-wall (32) approximately up to the edge of the



cigarette-group (12) without having a connection with an upper cover-wall (33) of the inner blank.

4,961,497

GOLF BAG CONTAINER

Douglas H. Sherer, 7607 N. Moonlight La., Paradise Valley, Ariz. 85253, and Fred M. Mills, 5529 S. Waverly Way, Tempe, Ariz. 85283

Filed Mar. 3, 1989, Ser. No. 318,242
Int. Cl.[5] A63B *55/00*; B65D *6/00*
U.S. Cl. 206—315.4 **15 Claims**

1. A shipping container for a golf bag, said container including

(a) an upper hollow body including

(i) a first generally tubular perimetrical side wall having an upper end and a lower open end,

(ii) a top wall connected to said upper end of said side wall and enclosing said side wall,

(iii) a first sleeve structure connected to and extending outwardly from said side wall, said sleeve structure being spaced away from said lower open end and intermediate said lower end and said upper end including spaced apart upper and lower contact surfaces each at an angle to said side wall;

(b) a lower hollow body including

(i) a second generally tubular perimetrical side wall having an upper open end and a lower end,

(ii) a lower wall connected to said lower end of said second side wall and enclosing said side wall of said lower body,

(iii) a second sleeve structure connected to and extending outwardly from said second side wall, said second sleeve structure including a primary support surface extending outwardly from and at an angle to said second side wall on a side of said second side wall adjacent said upper open end,

said first and second sleeve structures and upper and lower bodies being shaped, contoured, and dimensioned such that said upper body is movable between at least two operative positions,

(c) a first operative position with

(i) said lower end of said upper body slidably received by said lower body and within and at least partially circumscribed by said second sleeve structure, and

(ii) said lower contact surface bearing against said primary support surface; and,

(d) a second operative position with

(i) said upper body inverted from said first operative position,

(ii) said portion of said first side wall of said upper body intermediate said sleeve structure and said top wall extending downwardly inside said lower hollow body;

(iii) said upper contact surface bearing against said primary support surface, and

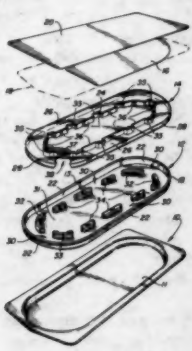
(iv) said lower open end opening outwardly away from said first and second sleeve structures.

4,961,498

OVAL WRAP SUTURE PACKAGE

Robert J. Kalinski, Milford, N.J.; Robert J. Cerwin, Pipersville, Pa., and Marvin Alpern, Glen Ridge, N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Aug. 24, 1988, Ser. No. 236,057
Int. Cl.[5] A61B *17/06*
U.S. Cl. 206—339 **22 Claims**



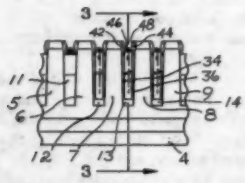
1. A package for retaining a wound suture which is formed of a polymeric material to define about the outer periphery thereof an oval channel in which a suture may be wound in an oval pattern, said package exhibiting a length and a width and said channel comprising two substantially straight, parallel sections extending along a major portion of said length, said substantially straight sections being interconnected at the ends of said package by two opposing arcuate sections extending across the width of said package, wherein said package further comprises a first piece and a second piece molded to form the top and inner wall of said channel, wherein said first piece further includes a central planar area in the plane of said channel floor, and said second piece further includes a depressed central area, wherein said depressed central area of said second piece overlies the central planar area of said first piece when said package pieces are engaged, wherein said channel includes an aperture for passage of a suture from said channel to said central area of said package, wherein said channel comprises opposing straight sides joined by two arcuate end sections, and wherein said aperture is located at the juncture of a straight channel side and an arcuate end section.

4,961,499

HEMOSTATIC CLIP CARTRIDGE

Rodney Kulp, Harleysville, Pa., assignor to Pilling Co., Fort Washington, Pa.

Filed Jan. 4, 1990, Ser. No. 461,116
Int. Cl.[5] B65D 85/00
U.S. Cl. 206—339 6 Claims



1. A cartridge for holding and dispensing pre-formed, generally U-shaped hemostatic clips, each clip having a pair of legs and a connecting portion extending from one leg to the other, the cartridge comprising a unitary molded cartridge body having: an elongated base; a plurality of parallel walls extending upwardly from the base and having faces extending transverse to the direction of elongation of the base and spaced from each other to define a series of clip-receiving slots between adjacent walls; post means, having a top and two sides, within each of the slots for supporting a clip with one leg of the clip on one side of the post means, the other leg of the clip on the opposite side of the post means, and the connecting portion engaged with the top of the post means; and at least one retaining projection in each slot formed on one of the walls defining the slot and extending adjacent to the top of the post means within the slot toward the opposite wall defining the slot; the retaining projection having a clip-engaging surface and being tapered so that it gradually increases in thickness, measured in a direction parallel to the direction of elongation of the cartridge base, from a narrow bottom portion adjacent the top of the post means to a wider intermediate portion above the narrow bottom portion, whereby the clip engaging surface overhangs the post means to provide secure retention of a clip in the slot.

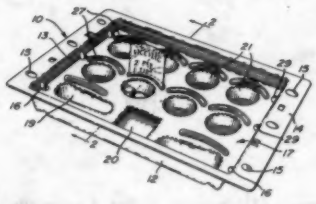
6. A cartridge for holding and dispensing hemostatic clips, comprising a plurality of generally U-shaped hemostatic clips, each clip having a pair of legs and a connecting portion extending from one leg to the other, and a unitary molded cartridge body having: an elongated base; a plurality of parallel walls extending upwardly from the base and having faces extending transverse to the direction of elongation of the base and spaced from each other to define a series of clip-receiving slots between adjacent walls, there being one of said clips in each clip-receiving slot; post means, having a top and two sides, within each of the slots, each post means supporting one of said clips with one leg of the clip on one side of the post means, the other leg of the clip on the opposite side of the post means, and the connecting portion engaged with the top of the post means; and at least one retaining projection in each slot formed on one of the walls defining the slot and extending adjacent to the top of the post means within the slot toward the opposite wall defining the slot; the retaining projection having a clip-engaging surface and being tapered so that it gradually increases in thickness, measured in a direction parallel to the direction of elongation of the cartridge base, from a narrow bottom portion adjacent the top of the post means to a wider intermediate portion above the narrow bottom portion, whereby the clip engaging surface overhangs the post means to provide secure retention of the clip in the slot.

4,961,500

MEDICAL DISPENSER TRAY

Maurice Coulombe, 4296 Place Charles-Bédard, Charlesbourg, Quebec, Canada G1H 5L9

Filed Dec. 18, 1989, Ser. No. 452,056
Int. Cl.[5] A61B 17/06; B65D 1/36, 83/04
U.S. Cl. 206—366 6 Claims



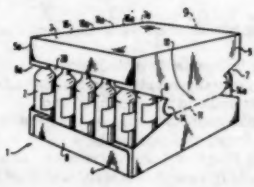
1. A medical dispenser tray comprising an outer container defining a shallow cavity and an inner tray operatively resting into the shallow cavity, with the inner tray forming elongated recesses each having a hole in one end thereof, and being constructed and arranged for resting of a syringe therein with its capped needle in engagement in the corresponding hole, whereby the syringe will be retained in longitudinal position in the corresponding recess; wherein the outer container includes side walls, each of the elongated recesses is positioned adjacent one side side wall of the outer container and has the hole in said one end thereof positioned remote from said one side wall relative to the other end of the same recess, and each of the elongated recesses is constructed and arranged for engagement of a syringe therein with the latter having the opposite end relative to the needle extending over the correpsonding one side wall of the outer container.

4,961,501

PACKAGE FOR A PLURALITY OF ITEMS

Otto Hansmann, Salmuenster, Fed. Rep. of Germany, assignor to Nestec S.A., Vevey, Switzerland

Filed Oct. 6, 1989, Ser. No. 417,890
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1988, 8812544[U]
Int. Cl.[5] B65D 5/54
U.S. Cl. 206—429 5 Claims



1. A pack for a plurality of elongate articles arranged such that elongate sides of the articles between two ends of the articles are parallel to one another in a form of a rectangular block comprising an upper part and a lower part each having a form of a rectangular tray having a base portion and two opposing tray wall portions extending from two opposing tray base edges for covering one end of the block of articles and further comprising two opposing sidewalls extending from two opposing tray base edges adjacent the opposing tray wall portions, each sidewall having a weakened wall member, which connect the upper part and the lower part such that the opposing tray wall portions define a first pair of opposed openings through which the articles may be seen and such that the two opposing connecting sidewalls and weakened wall mem-

bers are configured to define openings which are adjacent the first pair of opposed openings and which are separated by the weakened wall members such that the articles may be seen from four sides of the pack.

4,961,502

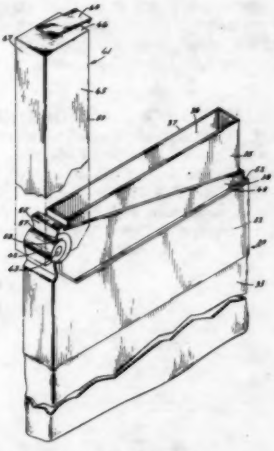
REUSABLE STERILE X-RAY CASSETTE HOLDER

Gerald R. Griffiths, 1113 S. 71st St., West Allis, Wis. 53214

Continuation-in-part of Ser. No. 146,306, Jan. 21, 1988, abandoned. This application Feb. 15, 1989, Ser. No. 311,129

Int. Cl.[5] B65D *81/18*

U.S. Cl. 206—455 21 Claims



1. An X-ray cassette holder for receiving non-sterile X-ray cassettes during operative procedures comprising:

a. hollow enclosure means for containing a non-sterile X-ray cassette and having an open end;

b. rigid collar means affixed to the open end of said enclosure means and having an upstanding open receiver portion for receiving and guiding said X-ray cassette during insertion into said enclosure means, said receiver portion including side and end walls inwardly spaced from the perimeter of said collar means;

c. said collar means having a peripheral ridge extending generally transversely between said collar perimeter and said receiver side and end walls;

d. cover means attached to said collar means and pivotable on a hinge between an open position exposing said receiver means and a closed position for sealing said container and its contents with the cover in a closed position and for permitting the removal or insertion of a non-sterile X-ray cassette when said cover is in an open position;

e. said cover means including side and end walls and a top and having its internal surfaces spaced from said receiver portion during opening and closing of said cover means and when said cover means is closed, said cover means engaging said ridge in its closed position to seal the interior of the holder from the exterior;

f. said hinge being adapted to prevent lateral movement of said cover means relative to said receiver portion for minimizing contamination from said non-sterile cassette; and,

g. said enclosure means, collar means and cover means being formed of materials which are capable of being sterilized and which also permit exposure of an X-ray cassette contained therein to X-rays.

4,961,503

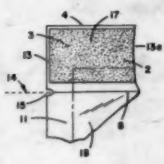
TAMPER EVIDENT NOTCHED SEALING ENVELOPE

Gary M. Bell, Crystal, Minn., assignor to Kapak Corporation, St. Louis Park, Minn.

Continuation of Ser. No. 169,376, Mar. 17, 1988, abandoned. This application Nov. 30, 1989, Ser. No. 443,821

Int. Cl.[5] B65D *3/26*

U.S. Cl. 206—627 4 Claims



1. An arrangement comprising:

(a) an envelope having an open orientation and closed orientation and means for converting said envelope from said open orientation to said closed orientation; said envelope having front and rear walls of metallized polymer characterized by the absence of perforations therein; said envelope open orientation having;

(i) said front and rear walls sealed to one another along upper and lower ends and opposing side edges to define an envelope interior having first and second, opposite, side edge seals;

(ii) a transverse incision in said front wall for providing access to said envelope interior, said transverse incision being below and generally parallel to said upper ends of said front and rear walls; and, said transverse incision extending between said front and rear wall side edge seals;

(iii) a double wall thickness flap whereat said front and rear walls are sealed to one another; said flap being oriented between said incision and said front and rear wall upper ends;

(iv) a coating of pressure sensitive adhesive on said flap; said coating being oriented on a portion of said flap comprising said front wall and oriented between said incision and said front wall upper end;

(v) a flap fold along which, when said envelope is converted from said open orientation to said closed orientation, said flap is foldable over said front wall incision; said flap fold axis comprising a portion of said rear wall extending along, aligned with, and adjacent to said incision in said front wall; and, said flap fold axis extending between said first and second side edge seals; said front wall not being sealed to said rear wall along said flap fold axis and between said first and second side edge seals;

(b) a tear notch in said first side edge seal aligned with said flap fold axis; and,

(ii) a tear notch in said second side edge seal aligned with said flap fold axis.

4,961,504

DOUBLE STRENGTH PEGBAR

Merle A. Larson, Leon Township, Goodhue County, Minn., assignor to Cannon Equipment Company, Cannon Falls, Minn.

Filed Sep. 8, 1987, Ser. No. 94,168

Int. Cl.[5] A47F *7/00*

U.S. Cl. 211—59.1 16 Claims

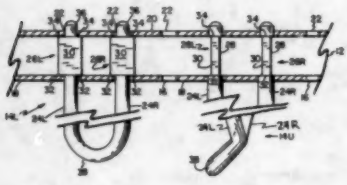
1. A pegbar for presenting goods, said pegbar comprising

(a) a peg support bar having at least two keyholes, said keyholes being spaced from each other;

(b) a generally U-shaped double strength wire peg having first and second elongate bodies defining a horizontal

plane for jointly supporting goods thereon, said bodies extending rearward and generally side by side from a common front nose;

(c) discrete and generally identical key means on a back end of each body for discrete and simultaneous supporting securement of both bodies in said keyholes with one key means being in each keyhole, each key means having key structure on a common axis with said horizontal plane for being locked in a respective keyhole, said key structures being simultaneously rotatable about their respective axis



in a respective keyhole from a normal locking position to an alternative unlocked position for insertion or removal; and in which

(d) said key means are simultaneously insertable straight into said support bar and are simultaneously removable straight from said support bar while said peg remains generally horizontal by twisting said nose with respect to said key means, thereby simultaneously and equally rotating both key structures about their respective axis from the locking position to the unlocked position while the peg remains generally horizontal.

4,961,505

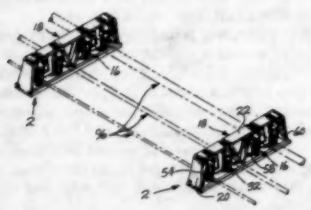
ROD HOLDER

David E. Moeller, Bainbridge Island, Wash., assignor to Loomis Plastics Incorporated, Seattle, Wash.

Filed Jan. 16, 1990, Ser. No. 464,547

Int. Cl.[5] A47F *7/00*

U.S. Cl. 211—70.8 **12 Claims**



1. In a rod holder,

a base plate

a bracket of substantially resiliently flexible material, relatively upstanding on the base plate at one side thereof,

said bracket having a rimmed infrastructure lying between opposing sides thereof, and a slot in the rim thereof which opens to the sides of the infrastructure,

said slot having a center plane perpendicular to the one side of the plate, and walls which depend from the rim to a point substantially contiguous to the one side of the plate, so that the body of the bracket is divided into two relatively resiliently displaceable portions having opposing walls on the opposing sides of the plane of the slot,

the walls of the body portions having successive pairs of part annular collar sections therein, the recesses of which are opposed to one another across the plane of the slot and define successive clamping rings, the diameters of which, in the normally relaxed condition of the bracket, are progressively smaller in the planar direction of the slot relatively toward the one side of the plate, so that the body portions of the bracket form a caduceus-like pair of clamps which are relatively reciprocable about said point, and have a nip between each pair of clamping rings at the plane of the slot,

and prop means in the body portions of the bracket for yieldably shoring up the pair of clamps,

said prop means being operable to bias the clamps in the direction of closing the nips, but yieldable in the opposing direction to the planar impalement of a rod in the slot at the rim of the infrastructure, and to depression of the rod through each successive nip thereafter, until a particular clamping ring has a diameter sufficiently commensurate with that of the rod to assure that the bracket will retain the rod against movement in the plane of the slot, when the rod is released in the bracket and the bracket resumes the normally relaxed condition thereof.

4,961,506

MULTI-TIER TOWER FOR GOODS DISPLAY

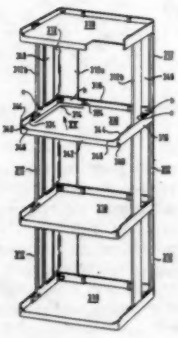
Franz J. Lang, Kelkheim, Fed. Rep. of Germany, assignor to Display-Design GmbH fur moderne Verkaufsforderungsmittel und Raumausstattung, Kelkheim, Fed. Rep. of Germany

Filed Jun. 15, 1988, Ser. No. 207,254

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1987, 3721559; European Pat. Off., May 13, 1988, 88107757.2

Int. Cl.[5] A47B *47/00*

U.S. Cl. 211—188 **40 Claims**



1. A multi-tier tower for goods display, having a plurality of tier trays (10) and having at least one vertical spacing support (12) of separate construction between each two successive tier trays (10), the at least one vertical spacing support (12) having two ends, wherein one end of the spacing support (12) is coupled to the respective tier tray (10) by means of an outer angle element (16) with horizontally extending line (C) of curvature and vertically extending surface line (H) fitted on the tier tray (10) or spacing support (12), and an inner angle element (14) with horizontally extending line (C) of curvature and vertically extending surface line (H) fitted on the complementary spacing support (12) or tier tray (10), in which the spacing support (12) has legs (12*b*, 12*c*) pointing horizontally, on the ends, which form parts of the respective curve or angle element (14), the inner angle element (14) having its outer face (14*b*) abutting the inner face (16*a*) of the outer angle element (16), the outer angle element (16) and inner angle element (14) being fastened in the direction of the line (C) of curvature and in the direction of the surface line (H) by an engageable and disengageable shape-engaging connection (26, 24*a*, 22, 20), wherein the angle element (14) relating to the spacing support (12) is free on the furthest side from the angle element (16) of the tier tray (10) in such a manner that the angle element (14) relating to the spacing support (12) may be fastened and re-

leased solely by movement (B) perpendicular in relation to the vertically extending surface line H of the respective angle element (16) of the tier tray (10), and in which the inner angle element (14) has counter-stop faces (26) facing away from an apex (S) of line (C) of curvature, the counter-stop faces (26) abutting on stop faces (24*a*) of the outer angle element (16), the stop faces 24(*a*) facing towards the apex (S) of the respective line (C) of curvature.

4,961,507

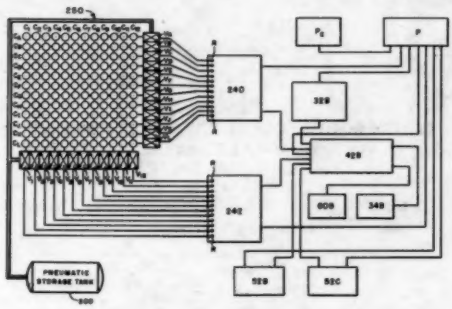
DISPENSING SYSTEM FOR HANDLING CONSUMABLE TOOLING AND SUPPLIES

Larry G. Higgins, 400 Keller Ave., Bartonville, Ill. 61607

Continuation of Ser. No. 932,930, Nov. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 756,340, Jul. 17, 1985, abandoned. This application Nov. 3, 1988, Ser. No. 267,678

Int. Cl.[5] G07F *11/00*; G06F *7/08*

U.S. Cl. 221—129 **18 Claims**



1. A fluid matrix switching system comprising:

a plurality of fluid cylinders, each cylinder arranged to provide a dispensing stroke and further each having a selected column address and a row address;

each cylinder being maintained under an initial fluid pressure;

first actuator means comprising a fluid valve for each column address and connected in common fluid communication to each fluid cylinder having the same column address and operative to condition each cylinder at said column address for actuation;

second actuator means comprising a fluid valve for each row address and connected in common fluid communication to each fluid cylinder having the same row address and operative to condition each cylinder at said row address for actuation; and

means to selectively activate one each of said first and second actuator means to condition the cylinders having one column address and one row address for actuating and to activate the cylinder having said one column and said one row address to provide a dispensing stroke.

4,961,508

CONDIMENT DISPENSER WITH PIVOTABLE ARM

Ralph Weimer, Wheaton, and Louis Porcaro, Orland Park, both of Ill., assignors to Restaurant Technology, Inc., Oak Brook, Ill.

Filed Jun. 12, 1989, Ser. No. 363,476

Int. Cl.[5] B65D *35/28, 5/42*; G01F *11/02*

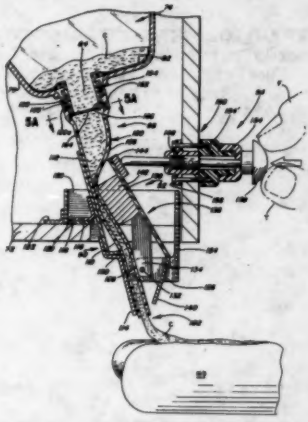
U.S. Cl. 222—181 **16 Claims**

1. A viscous fluid dispensing apparatus comprising:

(a) a length of resilient elastic tubing extending generally downwardly and having an upper tube section and a lower tube section;

(b) wall means for providing a wall adjacent said upper and lower tube sections; and

(c) an arm adjacent said tubing and positioned on the opposite side of said tubing from said wall means and mounted for pivotal movement about an axis moveable through dispensing and return strokes, said arm comprising an upper arm portion above the pivot axis and adjacent at least a portion of said upper tube section and a lower arm portion extending below said pivot axis and adjacent at least a portion of said lower tube section, said dispensing stroke comprising movement of said upper arm portion against a predetermined length of said upper tube section to compress said upper tube section against said lower



tube section to cause a flow of fluid from said upper tube section to said lower tube section, said return stroke caused by return of said compressed upper tube section to a less compressed position thereby moving said arm through said return stroke comprising pivoting movement of said arm in a direction opposite of said dispensing stroke and causing said lower arm portion to compress and close said tubing at the lower tube section at the end of said return stroke by compression of said lower tube section between said lower arm portion and said wall means.

4,961,509

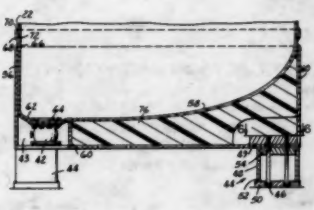
BULK PAINT CONTAINERS AND METHOD OF MAKING SAME

Glenn Currier, 7330 River Rd., Flushing, Mich. 48433

Filed Feb. 10, 1989, Ser. No. 308,475

Int. Cl.[5] B65D *87/00*

U.S. Cl. 220—5 A **21 Claims**



1. A bulk container comprising:

a body, said body having an inner bottom portion defining a receiving space and an outer bottom portion defining the lowermost extent of said body;

a drain valve mounted to said inner bottom portion for draining the receiving space and extending below said inner bottom portion, the lowermost extent of said drain

valve being higher than the lowermost extent of said outer bottom portion; and

upstanding leg members mounted to the body to hold the body off the ground;

said inner bottom portion is curved in such a way that said drain valve is mounted to the lowermost location of said inner bottom portion and all other locations on said inner bottom portion curve downwardly to this lowermost location.

4,961,510

SANITARY LID FOR METAL BEVERAGE CONTAINER

Frank Dvoracek, 728 E. Fairmont Rd., Burbank, Calif. 91501

Filed Oct. 13, 1989, Ser. No. 420,839

Int. Cl.[5] A47G *19/22*

U.S. Cl. 220—90.4 **6 Claims**

1. An auxiliary top for a beverage container of the type that includes a container top that is joined to a container body, said top and said body being joined at an upstanding peripheral ridge and having an aperture for permitting beverage flow therethrough, said auxiliary top comprising, in combination:

(a) a generally circular base;

(b) a pedestal-like member located adjacent the periphery of said base;

(c) said pedestal-like member having a generally arcuate shape and including a plurality of apertures at the top thereof;

(d) said top comprising a single integral article of resilient material that includes a circumferential skirt for engaging said container;

(e) said skirt being joined to a point intermediate the height of said base; and

(f) the interior of said skirt including lower and upper portions that taper inwardly to a point intermediate the interior of said skirt to define regions of internal diameter exceeding and less than the outer diameter of said upstanding peripheral ridge.

4,961,511

END CLOSURE FOR A PACKAGING CONTAINER

Lars-Erik Piltz, Dalby, Sweden, assignor to AB Akerlund & Rausing, Sweden

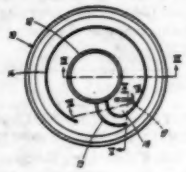
Filed Feb. 10, 1989, Ser. No. 309,250

Claims priority, application Sweden, Feb. 16, 1988, 8800516

Int. Cl.[5] B65D *17/34*

U.S. Cl. 220—270 **5 Claims**

1. An end closure for a packaging container comprising at least an outer formed from injection molded material having an easy opening device arranged therein including a grip, a circumferential tearing denotation inwardly adjacent a rim defining a periphery of said outer layer, a first tearing denotation extending from said grip to said circumferential tearing denotation a second tearing denotation spaced from said first tearing denotation and spaced inwardly of said circumferential tearing denotation and extending from said grip, said first tearing denotation, said second tearing denotation and said circumferential tearing denotation defining a tearing strip, said tearing strip defining a concave region adjacent said grip, and a recess



arranged cross-wise in a major part of an inlet to said concave area.

4,961,512

CHILDPROOF CLOSURE FOR LARGE CONTAINERS

John W. Von Holdt, 6864 Lexington La., Niles, Ill. 60648

Filed Jan. 30, 1989, Ser. No. 302,780

Int. Cl.[5] B65D *17/34*

U.S. Cl. 220—270 **13 Claims**

1. In a screw-top container lid which defines a top wall and a peripheral wall carried about said top wall, said peripheral wall having an inner surface that defines screw-threaded attachment means, the improvement comprising, in combination:

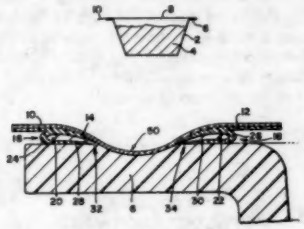
said peripheral wall being of annular shape and having a diameter of at least four inches;

said inner surface also defining ratchet means for engagement with corresponding ratchet means on a container when said lid is applied thereto, to permit screw-threaded rotation of the lid in a tightening direction to seal the lid on the container in closed condition, but to prevent counterrotation of the lid to permit removal from the container; and a portion of said peripheral wall defining removable tear strip means, said portion carrying some of said ratchet means, said peripheral wall defining a free edge, said peripheral wall being flexible to permit manually outward flexing of portions of said free edge and adjacent wall portions, a second portion of the ratchet means being positioned in spaced relation to the tear strip means, said second portion of the ratchet means comprising a pair of substantially diametrically opposed ratchet sections, said ratchet sections being sized and positioned to permit disengagement from the corresponding ratchet means by a single user by said manually, outward flexing of edge portions of said second portion, whereby a container carrying said lid in said closed condition may be opened by removing said tear strip means and said outward flexing of the edge portions of the second portion to disengage said second portion of the ratchet means, to facilitate said counterrotation of the lid.

4,961,513
CONTAINER WITH PEELABLE SEAL, AND METHOD FOR MAKING THE SAME

Graham M. Gossedge, Didcot; Alan J. Maskell, Harwell, and John Moore, Melton Mowbray, all of England, assignors to MB Group plc Engineering Company, Reading, England

Filed Dec. 16, 1988, Ser. No. 285,549
Claims priority, application United Kingdom, Dec. 21, 1987, 8729725
Int. Cl.[5] B65D *17/40*
U.S. Cl. 220—276 29 Claims



1. A container comprising a body with a rim of which at least the upper surface is of a first plastics material, and a flexible closure of which at least the under surface is of a second plastics material different from the first, the body and closure being attached together by a heat seal formed between the said surfaces thereof, wherein the heat seal includes radially inner and radially outer ears formed during the heat sealing operation by heat and pressure applied by a heat sealing head, each ear having a core which is formed of the first plastics material and is joined integrally to the rim by a thin root, and an envelope which is formed of the second plastics material integrally with the closure and which envelops the core and tapers in beneath the core to a position adjacent to the thin root of the core, both ears lying on the top of the rim around at least a substantial part of the container periphery, the closure having a free portion located outside the heat seal for grasping by the user, and the closure and both ears being manually peelable together away from the rim by use of the free portion.

4,961,514
REFUSE BINS

Thomas E. Palmer, Lancashire, United Kingdom, assignor to Glasdon Limited, United Kingdom

Continuation of Ser. No. 690,949, Jan. 14, 1985, abandoned. This application May 14, 1987, Ser. No. 51,243
Int. Cl.[5] B65F *1/08*; B65D *41/06*
U.S. Cl. 220—408 27 Claims

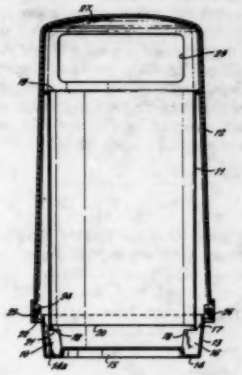
1. A refuse bin, comprising:

an open topped, refuse container with a bottom end and an upper end;

a shallow base having a bottom wall, an upstanding peripheral wall encircling the bottom wall and first support means, within the base and disposed above the bottom wall, for receiving the refuse container on the base, for supporting the container with the bottom end of the container spaced by a gap above the bottom wall of the base and for holding the bottom end of the container against lateral movement with respect to the base;

a one-piece removable cover for enclosing the open topped container, the cover being open at one end engaging the base and closed at an opposing end providing a closure over the upper end of the container, the opposing end of the cover projecting beyond the upper end of the container, the cover having a lateral wall with at least one side aperture therein through which refuse may be passed into the container within the cover;

second support means disposed around the peripheral wall of the base below an upper peripheral edge thereof, the open one end of the cover extending around the upper peripheral edge of the base and engaging the second support means; and

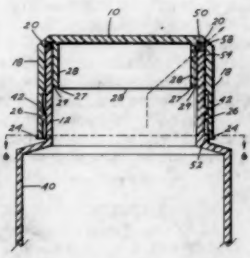


holding means, provided between the cover at the open one end and part of the peripheral wall of the base extending above the support means for holding releasably the cover on the base.

4,961,515
CLOSURE FOR A BOTTLE

Alexander R. Schreiber, 159 Windsong St., Thousand Oaks, Calif. 91360

Filed Sep. 27, 1989, Ser. No. 413,118
Int. Cl.[5] B65D *47/00*
U.S. Cl. 222—48 4 Claims

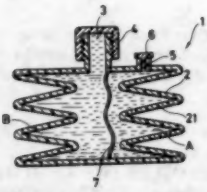


1. A closure for a bottle, comprising in combination;

a cap member having an annular exterior wall and a smaller diameter annular interior wall concentric with said exterior wall, said walls depending from a closed top end of said cap extending toward an oppositely disposed opened bottom end of said cap, a first dispensing aperture through said interior wall aligned with a second dispensing aperture through said exterior wall, said second dispensing aperture terminating at a juncture between said closed top end and said exterior wall of said cap, a space between said exterior wall and said interior wall, at least one annular seal ring depending from said closed top end of said cap between said two walls extending from said closed top end to at least a farther distant side of said first and second dispensing apertures, said annular seal ring having a dispensing notch aligned with said first and second dispensing apertures of said walls;

a generally cylindrical bottle neck attached to a bottle, said bottle neck adapted to fit into said space between said interior and exterior walls of said cap, means adapted to retain said cap on said bottle neck, a top edge of said bottle neck having an annular groove therein with said annular groove adapted to receive said annular seal ring of said cap to form a generally fluid tight seal therebetween, a dispensing notch in said top edge of said bottle neck positioned to allow alignment with said dispensing apertures and said dispensing notch of said cap by rotation of said cap relative to said bottle neck to form an open dispensing canal, means adapted to indicate said open dispensing canal, means adapted to indicate a closed said dispensing canal.

4,961,516
PROCESSING SOLUTION CONTAINER
Takashi Nakamura, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Mar. 14, 1989, Ser. No. 322,942
Claims priority, application Japan, Mar. 16, 1988, 63-62625
Int. Cl.[5] B65D *37/00*
U.S. Cl. 222—94 **7 Claims**

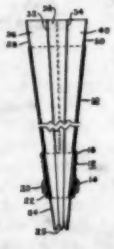


1. A processing solution container comprising

an integrally-formed expandable housing, having a single exterior wall, for receiving processing solution therein and being operative between at least a first state in which said housing is compressed and at least one second state in which said housing is expanded;

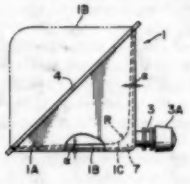
means associated with the housing for dividing the interior of the housing into a plurality of compartments, said dividing means sealing against fluid communication between said compartments when said housing is in said first state, and wherein expanding said housing to said at least one second state breaks said seal to allow fluid communication between at least two of said compartments.

4,961,517
DECORATING CAKES
Angela Tkac, 3714 SE. 6th Ave., Cape Coral, Fla. 33904
Filed Dec. 5, 1985, Ser. No. 804,766
Int. Cl.[5] B65D *35/22*
U.S. Cl. 222—94 **2 Claims**



1. A cake decorating dispenser for simultaneously applying a plurality of adjacently positioned different icings to cakes comprising a coupler base having a threaded lower end and an outwardly flared conically shaped upper end, a conical shaped cake decorating icing dispensing bag projected over the coupler base to provide a tight fit relative to the coupler base to insure a leak proof connection therewith, a conically shaped decorating tip selected from a plurality of assorted decorating tips having differently shaped outlets, a threaded coupler ring threadedly engaging the threaded lower end of the coupler base and the icing dispensing bag projected over the coupler base, an inwardly flared contraction of the threaded coupler ring engaging the conically shaped decorating tip to clamp the selected tip to the lower end of the coupler base, a conical shaped liner contoured to fit into the dispensing bag, and a plurality of intermediate panels in the conical shaped liner to provide a plurality of separate chambers to dispense a plurality of adjacent strips of decorative material.

4,961,518
CARTRIDGE CONTAINER
Iwao Shoji, Shibata, and Masataka Okushita, Tokyo, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan
Continuation-in-part of Ser. No. 238,111, Aug. 30, 1988, abandoned. This application Mar. 14, 1990, Ser. No. 496,073
Claims priority, application Japan, Sep. 2, 1987, 62-219626
Int. Cl.[5] B65D *35/08*
U.S. Cl. 222—107 **7 Claims**



1. A rectangular parallelpiped-shaped cartridge container into or from which a viscous fluid consisting of ink is supplied or removed, comprising:

a lower half container section made of a rigid material having an upper opening defined by an edge portion;

an upper half container section made of a pliant sheet material having a lower opening defined by an edge portion which is bonded to the edge portion of said rigid section, said rigid section and said pliant section being bonded along a diagonal plane of the cartridge container, the edge portion of said rigid section being constructed as a flange to which the edge portion of said pliant section is linearly bonded to seal the cartridge container; and

a spout disposed at a lower portion of said rigid section through which the viscous fluid is supplied into and removed from the cartridge container;

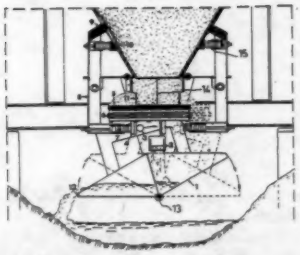
wherein said pliant section has a shape and is dimensioned to be foldable into an interior of said rigid section in a reversibly turned-over condition so as to closely oppose an inner wall of said rigid section, said pliant section being substantially entirely folded into said rigid section when the viscous fluid is substantially entirely removed therefrom through said spout, said rigid section and said pliant section having shapes and dimensions such that a space is defined between said rigid section and said pliant section which is adjacent said spout when said pliant section is substantially entirely folded into said rigid section.

4,961,519

LIME FEEDER

Anders Strandberg, Boxholm, Sweden, assignor to Boxholmkonsult AB, Boxholm, Sweden

Filed Feb. 3, 1989, Ser. No. 305,921
Claims priority, application Sweden, Feb. 4, 1988, 8800356
Int. Cl.[5] B65D 88/66
U.S. Cl. 222—133 4 Claims



1. A lime feeder for dispensing lime into a flowing stream of water, comprising:

a hopper having a downwardly directed outlet;

a metering vessel;

wall means including a generally upright dividing wall dividing the metering vessel into two laterally adjacent upwardly opening chambers;

horizontal axle means mounting the metering vessel for rocking movement between a first position in which one of said chambers is disposed for being filled and the other of said chambers is disposed for emptying, and a second position in which the other of said chambers is disposed for being filled and said one of said chambers is disposed for emptying;

said wall means for each chamber including sidewalls and a bottom wall defining an outlet through which, in use, water and lime pour for dispensing lime into a stream of water;

means defining a water inlet channel disposed for directing an inlet stream of water into whichever of said chambers is then disposed for being filled;

said horizontal axle means being centered under said water inlet channel and said generally upright dividing wall being disposed to be substantially vertical and vertically aligned with said horizontal axle means when said metering vessel while rocking from said first position to said second position is disposed midway between said first and said second positions; and

flow direction means associated with said outlet of said hopper and with said metering vessel for laterally directing lime flowing out of said hopper through said outlet laterally relative to the longitudinal axis of said horizontal axle means into preferentially greater vertical juxtaposition with whichever of said chambers as is then disposed for being filled;

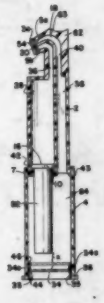
said flow direction means including a vertically extending partition wall arranged in said outlet in vertical alignment with said horizontal axle means, for dividing flow of lime from said outlet into a one portion disposed over said one chamber, and another portion disposed over said other chamber; and a valve means for selectively alternately permitting and preventing flow of said portions into the respective chambers, depending on which chamber is then disposed for being filled.

4,961,520

CO-DISPENSING CONTAINER AND METHOD OF FILLING SAME

Douglas J. White, Oceanport, N.J., assignor to Bio-Pak Associates, Farmingdale, N.J.

Filed Apr. 6, 1988, Ser. No. 178,274
Int. Cl.[5] B67D 5/52
U.S. Cl. 222—135 106 Claims



1. A dispensing container assembly comprising:

a base cup;

a plunger cup telescopingly received in said base cup and relatively slidable therein upon the application of pressure against said plunger cup;

nozzle means communicating with each of said base cup and said plunger cup;

a piston having a predetermined shape and being slidably movable within said plunger cup, whereby upon slidable movement of said plunger cup within said base cup a flowable product contained within said base cup can be expelled therefrom through said nozzle means and upon slidable movement of said piston within said plunger cup a flowable product contained within said plunger cup can be expelled therefrom through said nozzle means;

an actuating plunger for actuating said slidable movement of said piston upon the application of said pressure against said plunger cup; and

priming means for preventing premature discharge of said flowable product contained within said plunger cup prior to discharge of said flowable product contained within said base cup.

93. A dispensing container assembly comprising:

a base cup;

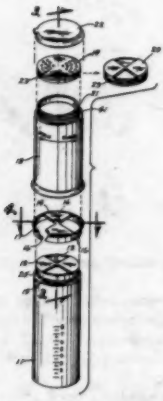
a plunger cup including an outer surface having a predetermined outer configuration, a partitioned area for housing a flowable product, and a bottom surface and being telescopingly received in said base cup and relatively slidable therein upon the application of pressure against said plunger cup;

nozzle means communicating with each of said base cup and said plunger cup; and

a piston having a predetermined shape, said partitioned area of said plunger cup having a predetermined inner surface having a shaped corresponding to said predetermined shape of said piston, said piston being slidably movable within said plunger cup, whereby upon slidable movement of said plunger cup within said base cup a flowable product contained within said base cup can be expelled therefrom through said nozzle means and upon slidable movement of said piston within said plunger cup a flowable product contained within said plunger cup can be expelled therefrom through said nozzle means; said plunger cup including an aperture extending therethrough at a location spaced from said bottom surface of said plunger cup, so as to directly connect said plunger cup with the external environment whereby said aperture can

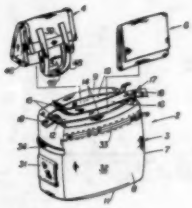
provide for venting of said plunger cup during filling of said plunger cup with said flowable product and for admission of air between said piston and said bottom surface of said plunger cup to facilitate dispensing of said flowable product from said plunger cup.

4,961,521
ADJUSTABLE METERED DISPENSER
Ronald E. Eckman, 1797 Bolling Ave., Louisville, Ky. 40210
Filed Nov. 21, 1989, Ser. No. 439,623
Int. Cl.[5] A47G *19/12*
U.S. Cl. 222—142.5 **1 Claim**



1. An adjustable metering dispenser apparatus consisting of:
cylindrical container means for holding free flowing materials, said cylindrical container means having an open end, a bottom and continuous sidewalls sealingly connected to said bottom;
a top operatively connected to said sidewalls and overlying said open end;
at least one opening disposed in said top;
cylindrical cap means for selectively opening or closing said opening in said top;
means for rotatably attaching said cap means to said container means;
a cylindrical metering chamber means slidable disposed on the exterior of said sidewalls for adjusting the size of the chamber therein by sliding said metering chamber means with respect to said container means;
closure means on one end of said metering chamber means for selectively opening or closing said metering chamber means;
metering cap means attached to said one end of said metering chamber means and disposed between said one end and said closure means for closing a portion of said one end of said metering chamber and permitting flow through another portion thereof; said metering cap means having a first enlarged cylindrical cap having a plurality of holes therethrough pivotally attached to said one end of said metering chamber means, wherein the diameter of the said first enlarged cap is equal to the diameter of the said metering chamber for movement between a first position covering said one end and a second position opening said one end; and said closure means having a second enlarged cylindrical cap pivotally attached to and having same diameter as said first cap, said second cap having a first position in juxtaposition to said first and a second position at least 90 degrees from said first position thereof, said second cap having a continuous position thereof for closing off said holes when said second cap is in the first position thereof.

4,961,522
UTILITY TRAVEL PACK
Randi R. Weber, 9349 Tearose La., St. Louis, Mo. 63126
Continuation of Ser. No. 107,661, Oct. 9, 1987. This application Mar. 20, 1989, Ser. No. 326,074
Int. Cl.[5] A45C *3/00*
U.S. Cl. 224—151 **6 Claims**



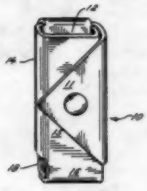
1. A utility travel pack convertible to different carrying modes comprising:
a bag member defining a storage chamber including a plurality of panel members respectively joined to form said bag member with at least one of said panel members having a bag access opening to said storage chamber;
a pair of elongated flexible bag straps, each having a first corresponding end fixed externally to said bag member to be in spaced opposed relationship and a second corresponding free end, each bag strap being folded back upon itself to form spaced bag strap loops, said bag straps also including spaced connector means for releasably connecting the bag straps at spaced locations in their folded back condition to provide for various spaced bag strap loop sizes;
an elongated flexible independent strap member having ring connector means at opposed ends thereof to connect with said spaced bag strap loops to place said bag member in a shoulder carrying mode, said independent strap member being hiddenly disposable with respect to said bag member when not in use;
a pair of spaced elongated flexible back-pack strap members, each having a first corresponding end fixed to said bag member and a second corresponding free end having a hook connector means thereon, said back-pack strap members being adapted to be hiddenly disposable when not in use;
a pair of spaced back-pack ring connector means fixed externally to said bag member to connect with said hook connector means on said corresponding free ends of said flexible back-pack strap members to place said bag member in a back-pack carrying mode;
pocket means including a pair of pocket members externally fixed to said side walls, said back-pack strap members being fixed within and near the top of one of said pocket members to facilitate hidden disposition therein when not in use; and
a pair of hold-down strap means fixed to opposing panel members to cooperate with the spaced bag strap loops to hold the bag straps against said bag when not in use.

4,961,523
BUTTERFLY KNIFE SHEATH
William G. Stimac, 404 Inglewood, Vicksburg, Miss. 39180
Filed Apr. 17, 1989, Ser. No. 338,856
Int. Cl.[5] B26B *29/02*; F41B *13/04*
U.S. Cl. 224—232 **6 Claims**

1. A knife sheath adapted for use with a butterfly knife having a blade, a handle having two movable legs, each having a first end pivotally attached to said blade and each having an opposite end, a pivotable actuating latch operatively associated with each opposite end which latches the legs together and

pivots to release the legs from each other, said latch extending laterally from said handle when in a latched position, said knife sheath comprising:

a housing having at least a first wall wherein said housing forms a cavity having an open top and a closed bottom and dimensioned to receive at least a portion of said knife with said opposite ends of said handle adjacent said bottom; and



means for engaging the pivotable actuating latch of said butterfly knife, said means including a notch formed in said first wall of said housing adjacent said latch wherein said means secures the knife within the housing when said knife is placed in said cavity and upon removing said knife from said cavity, said means causes said actuating latch to pivot thereby releasing the blade.

4,961,524

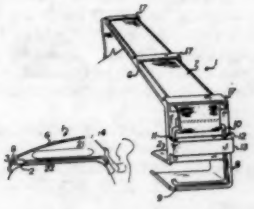
CAR CARRIER STRAPPING AID

Rick E. Hunts, 885 Barsby St., Vista, Calif. 92083

Filed Nov. 6, 1989, Ser. No. 431,990

Int. Cl.[5] B60R *9/048*

U.S. Cl. 224—324 **5 Claims**



1. In combination with a roof-mounted automobile luggage rack made from a plurality of beams, a strapping device which comprises:

a bracket adapted to engage one of said beams;

means for clamping said bracket on said beam;

a flexible boom extending from said bracket in a upwardly slanted direction; and

a strap connected at a first end to said means for clamping, said strap running along the entire length of said boom and having an opposite end section extending beyond said boom.

4,961,525

REUSEABLE TAPE DISPENSER

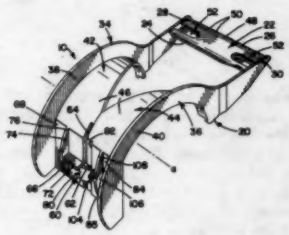
Thomas A. Corbo, Gates Mills; Brian A. Vulpitta, Avon Lake; Alan R. Greenleaf, Westlake, and Richard J. Kicak, Jr., Lagrange, all of Ohio, assignors to Manco, Inc., Westlake, Ohio

Filed Jun. 8, 1989, Ser. No. 363,639

Int. Cl.[5] B65D *85/672;* **B26F** *3/02*

U.S. Cl. 225—65 **11 Claims**

1. A roll tape dispenser comprising an integral molded plastic U-shaped frame including a forward tape guide wall portion having generally parallel extending forward outer and rearward inner edges, parallel opposite side edges, and a generally planar tape guide wall surface at its forward edge, said guide wall portion being provided with tape cutting means disposed along its said forward outer edge, and a pair of flexurable side wall arm portions disposed at right angles to the plane of said guide wall surface and extending along and rearwardly from the opposite side edges of said guide wall portion in generally side-by-side spaced apart relation, said arm portions being formed with complementary C-shaped side wall portions of arcuate shape spaced rearwardly from said guide wall portion and centered on an axis approximately parallel to said forward outer edge and lying approximately in the plane of said guide wall surface, said C-shaped side wall portions terminating in corresponding free ends located generally diametrically opposite the said guide wall surface and said side wall portions being provided with inwardly facing opposed hub portions of generally semi-cylindrical shape centered approximately on said axis for rotatably supporting a tape roll thereon, said hub portions being arcuately coextensive with said C-shaped side wall portions and terminating in free ends located at the said free ends of said C-shaped side wall portions, said side wall arm portions being flexurable away from one another a sufficient distance to permit insertion of a tape roll between the separated said hub portions for rotative mounting thereon, and said hub portions being provided with axially engageable and releasable snap-locking means located adjacent the said free ends thereof to firmly secure the said hub portions axially together thereat against axial separation, said locking means comprising a male prong member in the form of a flat tab-shaped member extending axially from one of said hub portions adjacent the said free end thereof and a female socket member in the form of a claw-type clutch member extending axially from the other one of said hub portions and comprising a pair of spaced flexurable jaws for easy snap-locking gripping engagement with said prong member and disengagement therefrom solely by pivotal flexure movement of said side wall arm portions and their associated said hub portions respectively toward and away from one another.



4,961,526

PAPER FEEDER

Sadao Unuma, Aichi, Japan, assignor to Tokai Kogyo Kabushiki Kaisha, Oobu, Japan

Filed May 9, 1989, Ser. No. 349,249

Claims priority, application Japan, May 10, 1988, 63-112894

Int. Cl.[5] B65H *20/20;* **B41J** *11/30*

U.S. Cl. 226—74 **3 Claims**

1. A paper feeder comprising:

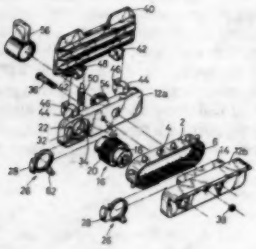
a pair of spaced opposed side frames;

a driving sprocket having extenal teeth on the outer circumferential surface thereof and a supporting shaft on which said driving sprocket is mounted and rotably mounted between said two side frames;

an endless feed belt having a portion around said driving sprocket and having feed pins on the outer circumferential surface projecting outward therefrom and engageble with perforations in perforated paper, and having internal teeth

on the inner circumferential surface thereof meshed with said external teeth for being turned by said driving sprocket to feed perforated paper; and

a pair of ring member pivotably mounted around the ends of said supporting shaft at opposite ends of said driving sprocket, each of said ring members having an arcuate friction wall thereon extending to a position opposed to the outer circumferential surface of said portion of said



feed belt extending around said sprocket with a predetermined clearance between the inner circumferential surface of said friction wall and the outer circumferential surface of said feed belt, and a belt engaging member on said ring member and extending to a position spaced just outwardly of the portion of said feed belt as it comes off said driving sprocket in a direction in which said feed belt is driven by said driving sprocket.

4,961,527

PAPER TRANSPORTING TRACTOR FOR PRINTERS

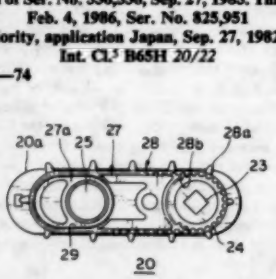
Teruo Sakamoto, Chigasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 536,336, Sep. 27, 1983. This application Feb. 4, 1986, Ser. No. 825,951

Claims priority, application Japan, Sep. 27, 1982, 57-168066

Int. Cl.[5] B65H *20/22*

U.S. Cl. 226—74 **24 Claims**



1. A tractor feed device for feeding a paper sheet by engaging with sprocket holes provided along at least one side of the sheet, comprising:

a first endless belt having an outer peripheral surface provided with pins for engagement with the sprocket holes of the paper sheet and an inner surface provided with serrations, said first belt being extended to have opposed ends of its inner surface looped over a first guide means and a drive means, the first guide means being stationary with respect to movement of the first belt, spaced apart from the drive means and including a first through-hole for receiving therein a first shaft, the drive means including a toothed wheel engaged with the serrated inner surface of the first belt and having a second through-hole for receiving therein a second shaft; and

a second endless belt, which has smooth and unperforated inner and outer surfaces, looped around said first guide means and interposed between an outer peripheral surface of said first guide means and the inner surface of said first belt, said second belt being made of a low friction material such that it reduces friction between said first between said first belt and said first guide means and being not in mechanical mesh with said first belt.

4,961,528

METHOD OF PROVIDING A SEMICONDUCTOR BODY ON A SUPPORT

Petrus J. M. Peters, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 21, 1989, Ser. No. 326,583

Claims priority, application Netherlands, Apr. 8, 1988, 8800902

Int. Cl.[5] B23K *103/10*; H01L *21/48, 21/58, 21/603*

U.S. Cl. 228—123 **1 Claim**

1. A method of bonding a semiconductor body to a support comprising applying a layer of aluminum by flame spraying to a surface of the support and pressing the semiconductor body against the surface of the support provided with the aluminum layer while applying heat to said surface thereby forming a thermo-compression bond between the semiconductor body and the support.

4,961,529

METHOD AND COMPONENTS FOR BONDING A SILICON CARBIDE MOLDED PART TO ANOTHER SUCH PART OR TO A METALLIC PART

Bernd Gottselig, Frechen; Ernö Gyarmati, and Aristides Naoumidis, both of Jülich, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Dec. 20, 1988, Ser. No. 287,342

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744245; Dec. 24, 1987, 3744250; Apr. 11, 1988, 3811945

Int. Cl.[5] B23K *1/012*

U.S. Cl. 228—124 **25 Claims**

1. Process for bonding a first molded body of silicon carbide to a second molded body of silicon carbide, said first and second bodies having respective surfaces to be joined which match each other in configuration, said process comprising the steps of:

interposing a Ti_3SiC_2 layer between and in contact with said matching surfaces of said first and second bodies, and

heating and hot-pressing said bodies and their said matching surfaces together with said Ti_3SiC_2 layer interposed between them in the presence of a reducing protective gas at a temperature in the range from 1200° to 1600° C. for at least 30 minutes with pressing of said bodies together with a pressure from 5 to 100 MPa, and thereby firmly joining said first and second bodies at their said matching surfaces.

6. Process for bonding a first molded body of silicon carbide to a second molded body of silicon carbide, said first and second bodies having respective surfaces to be joined which match each other in configuration, said process comprising the steps of:

preliminarily polishing said matching surfaces of said bodies;

applying to at leat one of them a titanium layer having a thickness greater than 1μm and not greater than 3μm, and

heating and hot-pressing said bodies and their said matching surfaces together with said titanium layer interposed between them in the presence of a reducing protective gas at a temperature in the range from 1200° to 1600° C. for at

least 30 minutes with pressing of said bodies together with a pressure from 5 to 100 MPa thus causing said titanium layer to be converted into a persistent Ti_3SiC_2 layer which firmly joins said first and second bodies at their said matching surfaces.

4,961,530

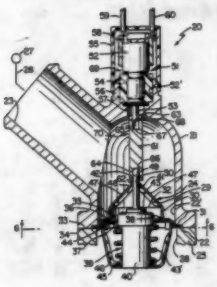
ENGINE COOLING SYSTEM, STRUCTURE THEREFOR AND METHODS OF MAKING THE SAME

Joseph P. Wagner, Knoxville, Tenn., assignor to Robert Shaw Controls Company, Richmond, Va.

Division of Ser. No. 252,693, Oct. 3, 1988, Pat. No. 4,890,790. This application Oct. 10, 1989, Ser. No. 418,859

Int. Cl.[5] F01P 7/02

U.S. Cl. 236—34.5 5 Claims



1. In a structure for controlling an engine cooling system, said structure comprising a housing means having an inlet and an outlet, and a thermostat construction disposed in said housing means between said inlet and said outlet for controlling the degree of fluid flow therebetween, said thermostat construction comprising a valve seat unit, a valve closing unit for opening and closing said valve seat unit, spring means operatively interconnected to said valve closure unit to tend to close the same against said valve seat unit, and a temperature responsive device comprising a piston member and a cylinder member that are adapted to provide relative movement therebetween when the device senses certain temperatures, said cylinder member being interconnected to said valve closure unit to move the same in unison therewith in opposition to the force of said spring means when said piston member is fixed from movement relative to said housing means, a movable stop means carried by said housing means and having a plurality of different set positions relative to said piston member so as to be engaged by said piston member at the particular set position of said stop means and thereby fix said piston member to said housing means at that particular set position so that once said piston member has been moved against said stop means by said device sensing a particular temperature, said device will cause said cylinder member to move to open said valve closure unit relative to said valve seat unit when said device senses a certain higher temperature than said particular temperature, said stop means comprising a second piston member that is carried by said housing means, said stop means comprising moving means for moving said second piston member to different set positions thereof, the improvement wherein said piston members face each other in spaced apart axially aligned relation and wherein said stop means comprises a rod means interconnecting the piston members, said rod means having means for removably attaching the rod means to the piston members, and said rod means having means for providing a lost-motion connection between said piston members and said rod means in one of said set positions of the second piston member.

4,961,531

IRRIGATION METHOD AND APPARATUS

Barend J. M. Nel, P O Box 13, Louis Trichardt, North Eastern Tvl, South Africa (0920)

Filed Sep. 21, 1988, Ser. No. 247,235

Claims priority, application South Africa, Sep. 22, 1987, 87/7102

Int. Cl.[5] B05B 3/02, 3/18, 17/04

U.S. Cl. 239—1 9 Claims

1. A method of operating a mechanised irrigation system to irrigate a land, the system comprising a movable elongated irrigation pipe carrying a plurality of primary sprayers capable of applying liquid to the land at volumetric rates falling within a first, lower range of rates, and at least one secondary sprayer carrying structure which is movable relative to the main pipe and capable of applying liquid at volumetric rates falling within a second range of rates, higher than the first range, the method comprising the steps of:

(a) driving the main pipe to traverse the land to be irrigated;

(b) causing the primary sprayers to apply liquid to the land in an elongate region substantially parallel to the dimension of elongation of the main pipe at rates falling within the first range of rates;

(c) causing the at least one secndary sprayer to apply liquid to the land at a rate falling within the second range of rates, higher than the first range; and

(d) driving the secondaary structure to continuously move it relative to the main pipe to cause the secondary sprayers to apply liquid to a portion of the elongate region and beyond the elongate region, to thereby limit run-off of liquid applied at the second, higher rate.

4,961,532

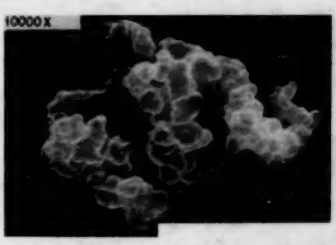
FRAGRANCE RELEASE DEVICE CONTAINING A HIGHLY ADSORPTIVE COPOLYMER

Kathryn R. Tsugney, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jul. 7, 1989, Ser. No. 376,491

Int. Cl.[5] A61L 9/04

U.S. Cl. 239—60 6 Claims



1. A fragrance releasing device comprising a container having at least two chambers, one chamber being constructed of an air impermeable material and the other chamber being constructed of an air permeable material, means forming a channel for providing communication between the two cham-

bers, the channel forming means providing a reduced and restricted passageway between the two chambers, the passageway being of a diameter substantially less than the diameter of the two chambers, porous particulate carrier means in one of said chambers, the size of the passageway being sufficient for allowing passage of the particulate carrier means from one chamber to the other chamber when the container is inverted, the particulate carrier means being in the form of a powder, the powder constituting a combined system of particles, the system of powder particles including unit particles of a size less than about one micron in average diameter, agglomerates of fused unit particles of sizes in the range of about twenty to about eighty microns in averages diameter, and aggregates of clusters of fused agglomerates of sizes in the range of about two hundred to about twelve hundred microns in average diameter, and a fragrance contained and entrapped within the carrier means.

4,961,533

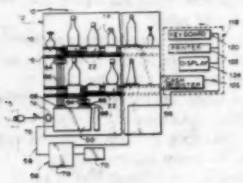
INVENTORY CONTROL SYSTEM

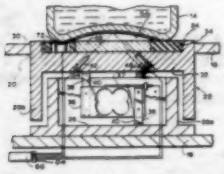
David M. Teller; Richard Sheryll, and Lance Ong, all of New York, N.Y., assignors to Vlac Inc., New York, N.Y.

Continuation-in-part of Ser. No. 413,544, Sep. 27, 1989, abandoned. This application Oct. 30, 1989, Ser. No. 428,408

Int. Cl.[5] **G01G** *19/40*; **G06F** *15/24*

U.S. Cl. 177—25.19 **26 Claims**





1. Apparatus for automatically determining the weight of a plurality of articles, each of the articles having a surface portion with a unique element thereon, comprising:

(A) a plurality of assemblies, each including (i) a surface for supporting an article, (ii) a transducer in operative contact with said supporting surface for producing an output signal indicative of the weight of an article placed on said supporting surface, and (iii) a sensor in operative relationship with an article on said supporting surface for producing an output signal indicative of the unique element on the surface portion of the article; and

(B) means for receiving said transducer output signals and said sensor output signals and, for each article on said supporting surfaces, for computing the weight of the article based on said transducer output signal and for identifying the article based on said sensor output signal.

4,961,534

SPRINKLER NOZZLE MODULE

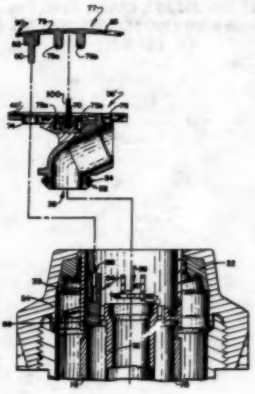
Stephen L. Tyler, Diamond Bar, and John L. Staylor, Riverside, both of Calif., assignors to The Toro Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 123,420, Nov. 20, 1987, Pat. No. 4,840,312. This application Oct. 31, 1988, Ser. No. 265,188

The portion of the term of this patent subsequent to Jun. 20, 2006, has been disclaimed.

Int. Cl.[5] **B05B** *15/10*

U.S. Cl. 239—205 **17 Claims**



1. A rotating pop-up sprinkler comprising:

(a) a tubular body suitable for connection to a water source;

(b) an elongate tubular riser assembly received within the body and in fluid communication therewith, comprising a lower non-rotating portion and an upper rotating portion rotatably coupled thereto, wherein the riser assembly has retracted and extended states relative to the body, and wherein the upper rotting portion of the riser assembly comprises a substantially cylindrical wall having an inner surface;

(c) a ring-like cap attached to the top of the body having an annular upper rim;

(d) an annular wiper seal captured within the cap and in contact with an underside of the cap rim;

(e) a compression spring acting between an underside of the wiper seal and the non-rotting portion of the riser assembly for urging the riser assembly toward its retracted state;

(f) a nozzle module removably connected to the rotating portion of the riser assembly, the nozzle module comprising a nozzle holder and a nozzle received thereby and in fluid communication therewith, wherein:

(i) the nozzle holder comprises an upper lid and a body and the body forms a nozzle aperture to receive the nozzle, wherein the nozzle holder body forms a plurality of radially outwardly extending members and operatively connected to the inner surface of the upper rotating portion cylindrical wall is means for engaging the nozzle holder body members, wherein rotation of the nozzle module in a first direction relative to the riser assembly rotating portion effects engagement between the members and the member receiving means, and rotation of the nozzle module in a second direction, opposite the first direction, relative to the riser assembly rotating portion effects disengagement therebetween;

(ii) the upper lid of the nozzle holder is accessible when the riser assembly is in its retracted state and the lid forms one or more torque apertures for receiving means for applying torque to the nozzle holder, whereby the nozzle module can be twisted in the first and second

directions relative to the rotating portion of the riser assembly to engage and disengage the nozzle module with and from, respectively, the riser assembly rotating portion without extending the riser assembly; and

(iii) the nozzle aperture is below the rim of the cap and is therefore covered and protected when the riser assembly is in its retracted state; and

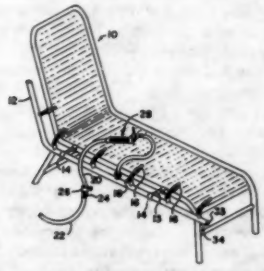
(g) a removable security cover suitable for covering the torque aperture or apertures in the upper lid of the nozzle holder, wherein when the security cover is in place the torque applying means cannot engage the torque aperture or apertures in the upper lid of the nozzle holder to disconnect the nozzle module from the riser assembly rotating portion, but when the security cover is removed the torque applying means can be inserted into the upper lid torque aperture or apertures and torque can be applied to the nozzle module to rotate it in the second direction relative to the riser assembly upper portion to effect its removal.

4,961,535

CHAISE LOUNGE MISTING DEVICE

John Skiblk, 57 Ballston Ave., Apt. 110, Saratoga Springs, N.Y. 12866

Filed Feb. 23, 1988, Ser. No. 159,244
Int. Cl.[5] B05B *17/00*
U.S. Cl. 239—289 **5 Claims**



1. A cool water misting device for outdoor use on a chaise lounge, comprising:

tubing adapted for placement in close proximity to a chaise lounge;

an adapter connected to said tubing for receiving a hose, said adaptor having primary valve means for permitting water flow from a water source through the hose to said tubing;

a plurality of spray nozzle attached at specifically spaced intervals along said tubing;

means for adjusting the direction of water flow from said spray nozzles;

means for controlling the amount and pressure of water flow through said spray nozzles, said water flow control means movable between a depressed position increasing water pressure and water flow into the tubing and a release position decreasing the water pressure and flow into the tubing; and

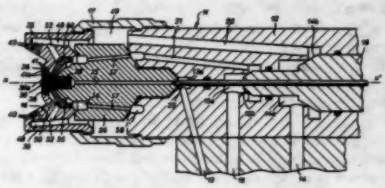
water flow drainage means for maintaining a constant supply of cool water, said drainage means including means for closing said drainage means when the water flow control means is moved toward the depressed position and opening said drainage means when the control means is moved to the release position.

4,961,536

PNEUMATIC LIQUID SPRAYING DEVICE

Jean-Yves Correard, 2 Allée de la Draye, 38610 Gieres, France

Filed May 2, 1989, Ser. No. 346,614
Claims priority, application France, May 3, 1988, 88 05926
Int. Cl.[5] B05B *1/28*
U.S. Cl. 239—296 **11 Claims**



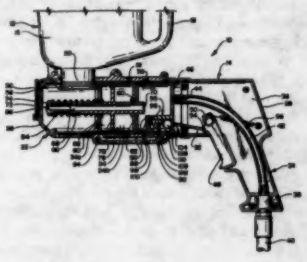
1. Pneumatic liquid spraying device comprising a spray nozzle in the center of which is provided a liquid ejection channel and further comprising stream shaping air ejection channels, spraying air ejection channels, and at least one entrainment air ejection channel, said at least one entrainment air ejection channel being provided coaxially and parallel to said liquid ejection channel and emerging on one frontal face of said spray nozzle on which also emerges said liquid ejection channel, characterized in that said spraying air ejection channels emerge on said frontal face and extend obliquely to the axis of said liquid ejection channel for forming spraying air streams directed toward a first region along the liquid channel axis, said shaping air ejection channels form air streams directed toward a second region along the liquid ejection channel axis downstream of the first region, and said at least one entrainment air ejection channel is independent of the other aforementioned air channels and is designed to be supplied by specific compressed air at a pressure generally different from that of each of the other aforementioned air ejection channels.

4,961,537

PRESSURE OPERATED SPRAY APPLICATOR

Donald J. Stern, Bellingham, Wash., assignor to DJS & T Limited Partnership, Bellingham, Wash.

Filed Sep. 28, 1989, Ser. No. 413,786
Int. Cl.[5] B05B *7/30*
U.S. Cl. 239—348 **10 Claims**



1. A spray applicator to discharge a fluid material in a spray pattern by means of pressurized air, said applicator comprising:

a. a housing having a front end and a rear end, with said housing comprising:

i. a front wall and a first intermediate wall positioned rearwardly of the front wall, and defining with said front wall a front fluid containing chamber, said front wall having a

front discharge opening leading from the fluid containing chamber,

ii. a second intermediate wall positioned rearwardly of said first intermediate wall, and defining with said first intermediate wall a secondary pressurizing chamber,

iii. a third rear wall positioned rearwardly of said second intermediate wall, and defining therewith a main pressurizing chamber which is located rearwardly of said secondary pressurizing chamber;

b. a discharge stem defining a through air passageway and having a front outlet end and a rear inlet end, said discharge stem having a forward portion positioned in said containing chamber, and a rear portion extending through said first and second intermediate walls, in a manner so as to be moveable in a forward to rear direction;

c. a locating piston means being fixedly secured to said discharge stem and being positioned in said secondary pressurizing chamber so as to be moveable from a forward closure position at which the front end of the discharge stem closes the front discharge opening from the containing chamber, and a rear position where the front end of the discharge stem is spaced rearwardly of the outlet opening from the containing chamber;

d. a bypass passageway means having a first end leading from said main pressurizing chamber and a second end connecting to a forward portion of said secondary pressurizing chamber, whereby pressurized air in said main pressurizing chamber is able to flow through said bypass passageway into said secondary pressurizing chamber forwardly of said locating piston;

e. a spring means operatively connected between said discharge stem and said housing to urge said discharge stem forwardly into the closed position;

f. means to deliver pressurized air into said main pressurizing chamber;

g. said spring means, said locating piston, and said bypass passageway means being arranged in a manner that when a predetermined level of pressure is reached in said main pressurizing chamber, air pressure transmitted into said secondary pressurizing chamber forwardly of said locating piston is sufficient to overcome a force exerted by said spring means to cause said discharge stem to move rearwardly so that the forward end of the discharge stem moves away from the discharge opening leading from the containing chamber;

h. operator actuated pressure control valve means which is operatively connected to said bypass passageway means and to said main pressurizing chamber, said valve means having a first position by which pressurized air flows from said main pressurizing chamber, through said bypass passageway means and to the forward portion of the secondary pressurizing chamber to cause the discharge stem to move rearwardly and by which said pressurized air flows from said main pressurizing chamber through said air passageway of the discharge stem, and a second position where air in the forward portion of the secondary pressurizing chamber is vented to reduce pressure in said forward portion, while any flow from said main pressurizing chamber is sufficiently limited so that a pressure level in said main pressurizing chamber is sufficiently high to maintain said flow of pressurized air through the discharge stem;

whereby when pressurized air flows into said pressurizing chamber, with said valve means in said first position, there is an immediate outflow of air through said air passageway in the discharge stem, and also pressurized air flows through said valve means and through said bypass passageway into the forward portion of the secondary pressurizing chamber and reaches a level to cause rearward movement of said locating piston and said stem, so as to permit fluid in said containing chamber to pass into an airstream passing from said discharge stem and be discharged into the airstream through the discharge opening, and when said valve means is moved to said second position, air is vented from the forward portion of said secondary pressurizing chamber so as to reduce pressure in said forward portion so that said locating piston and said discharge stem move forwardly so that the front end of the discharge stem closes the front discharge opening from the containing chamber while pressurized air continues to flow from said main pressurizing chamber through said discharge stem and out the front outlet end of the stem.

4,961,538

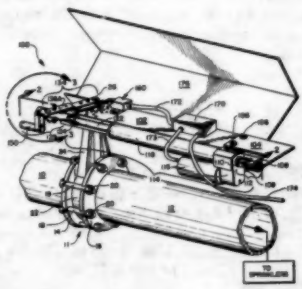
ADAPTABLE IRRIGATION VALVE OPERATION SYSTEM

Ronnie D. Hewitt, Rte. 1, Bo 48, Oakley, Id. 83346

Filed Apr. 8, 1988, Ser. No. 179,078

Int. Cl.[5] B05B *3/00*

U.S. Cl. 239—728 **42 Claims**



1. A system for operating an irrigation valve in an irrigation system, the valve having a valve stem and a valve body, the opening and closing of the valve being controlled by rotation of the valve stem, the system comprising:

reciprocating rod means for extending and retracting a rod from a housing;

connecting arm means having first and second ends, said first end attached to the valve stem and said second end attached to the rod such that the extension and retraction of the rod causes the rotation of the valve stem;

mounting means for holding the reciprocating rod means in position in relation to the valve body, said mounting means comprising means for alternately attaching the mounting means to a first irrigation valve having a first mounting configuration and to a second irrigation valve having a second mounting configuration; and

control means for selectively causing the reciprocating rod means to selectively extend and retract the reciprocating rod such that the irrigation valve is operated and the amount of water flowing to the irrigation system downstream from the valve is controlled.

4,961,539

TRUCK-MOUNTED PALLET CHIPPER

K. Michael Deem, 1123 N. High, Lancaster, Ohio 43130

Filed Aug. 1, 1989, Ser. No. 388,020

Int. Cl.[5] B02C *21/02*

U.S. Cl. 241—36 **46 Claims**

1. A mobile, highway-useable, solid waste material reducing machine comprising:

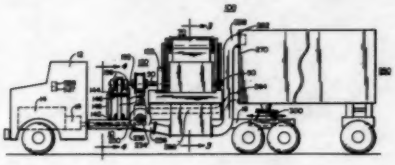
a. a mobile highway-type vehicle having a chassis;

b. a shredding means mounted on said chassis;

c. a drive means mounted on said mobile vehicle for selectively operating said mobile vehicle and said shredding means;

d. a torsional stress and strain reducing means connected between said drive means and said shredder means for reducing torsional stress and strain to said drive means;

e. a lifting means attached to said chassis for lifting waste material into said shredding means; and



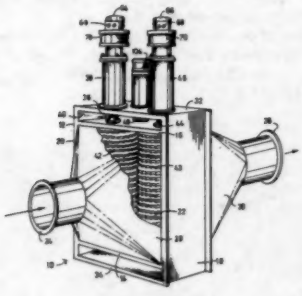
f. a removal means for removing shredded waste material from said shredding means.

4,961,540

THREE SHAFT COMMINUTION APPARATUS

Bruce O. Wiesemann, South Pasadena, Fla., assignor to Wiesemann Enterprises, Inc., Largo, Fla.

Filed Aug. 31, 1989, Ser. No. 401,419
Int. Cl.[5] B02C *18/06*
U.S. Cl. 241—46 B **17 Claims**



1. A comminution apparatus for solid waste materials in a waste water effluent stream comprising:

a housing having oppositely positioned side plates and end plates enclosing a comminution chamber together with input and output ports for directing the water borne waste through the comminution chamber,

the housing enclosing parallel first, second and third shafts mounted transverse to the direction of flow of the waste water, the first and second shaft each supporting multiple spaced apart cutter blades with a toothed end, the first shaft capable of turning in a clockwise direction and the second shaft capable of turning in a counter clockwise direction, each toothed cutter blade on a first or second shaft being co-planer with a toothed cutter blade from the other shaft, the third shaft supporting multiple spaced apart shearing cutters with at least one knife edge on each cutter, the third shaft cutters overlapping adjacent first and second shaft toothed cutters, the third shaft being mounted distal from the waste water input flow behind the first and second shaft mounted proximal to the waste water input flow, and

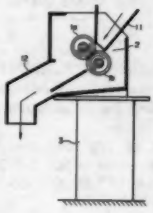
a pair of bearing plates parallel to but spaced apart from each housing end plate attached to the housing side plates, the bearing plates supporting a means for driving the shafts.

4,961,541

APPARATUS FOR DISPOSING OF A USED HYPODERMIC SYRINGE

Teiji Hashimoto, Kanagawa, Japan, assignor to Kabushiki Kaisha Fuso, Yokohama, Japan

Filed Sep. 1, 1989, Ser. No. 401,782
Int. Cl.[5] B02C *19/12, 19/18*
U.S. Cl. 241—65 **4 Claims**



1. An apparatus for disposing of a used hypodermic syringe comprising:

a housing having an opening for charging said hypodermic syringe to be disposed and a chute for discharging said hypodermic syringe after having been disposed;

a drive motor in said housing;

first and second collapsing gears synchronously driven by said motor, said collapsing gears being arranged in said housing in a position such that teeth of said gears are meshed together without any direct contact with each other during rotation thereof;

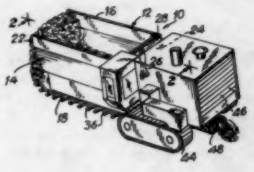
means for applying a voltage to said first collapsing gear while ensuring insulation between said collapsing gears, wherein said first collapsing gear is provided with an insulating bush for electrically insulating said first collapsing gear from said second collapsing gear such that a hypodermic needle, forming part of said hypodermic syringe, upon being charged into said apparatus from said opening causes said collapsing gears to short-circuit by contacting said needle with said collapsing gears so that said needle is burnt, and said syringe is crushed between said collapsing gears and discharged from said chute.

4,961,542

MATERIAL REDUCER

Todd Den Besten, Schodack, N.Y., and Leroy E. DenBesten, Westlyn Grove, Box 344, Valatie, N.Y. 12184, assignors to Leroy E. DenBesten, Castleton, N.Y.

Filed Feb. 3, 1989, Ser. No. 306,450
Int. Cl.[5] B02C *21/00*
U.S. Cl. 241—101.7 **13 Claims**



1. A material reducing apparatus for reducing the size of waste material and debris of land fills, demolition sites, raising and gutting existing buildings, land clearing areas, manufacturing and construction sites and the like comprising: a hopper having a pair of opposed sides, a front end and a back end, the back end having a top and bottom and a shearing edge at the bottom, said shearing edge being substantially horizontal and being stationary during the reducing operation, a boom, a

chain on the boom, the chain forming the floor of the hopper, bit means on the chain for cooperating in shredding and chewing the material to be reduced, drive means coupled with the chain for driving the chain so that the bit means moves towards the shearing edge, whereby the moving bit means cooperates further with the shearing edge to reduce the material to a predetermined size, the reducing of the material occurring substantially throughout the floor of the hopper by the bit means on the chain with the final shredding and chewing of the material occurring at the shearing edge.

4,961,543

ROTATION ADJUSTING APPARATUS IN A CRUSHER

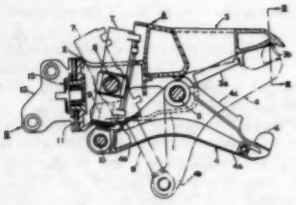
Seiichi Sakato; Masahiko Sakato; Kunihiko Matsui, and Nobuo Watanabe, all of Chiba, Japan, assignors to Kabushiki Kaisha Sakato Kosakusho, Japan

Filed Jul. 14, 1989, Ser. No. 379,780

Claims priority, application Japan, Jul. 26, 1988, 63-184664

Int. Cl.[5] B02C *1/06*

U.S. Cl. 241—266 **12 Claims**



1. A rotation adjusting apparatus in a crusher, comprising:
a rotational housing;
a pair of pawls for crushing or cutting a reinforced concrete or a steel frame, at least one of the pawls being swung by a driver;
a holding member provided on an outer periphery of a sleeve member which is fixed to a rotating disc integral with the housing;
a fixing member held through spacers between the holding member and the rotating disc;
the rotating disc being superposed on the fixing member so that the housing is capable of being provided rotatable relative to the fixing member; and
rotation restricting means, disposed between the rotating disc and fixing member, for increasing resistance to rotation of the housing at a desired rotational angle
wherein said holding member is slidable on its inner peripheral surface on the outer peripheral surface of said sleeve member and selectively movable along the sleeve member to advance the fixing member toward the rotating disc in the event of spacer wear.

4,961,544

CABLE TENSIONER WITH A WINDING DRUM FOR A SKI BOOT

Vincenzo Bidola, Castelfranco/Vento, Italy, assignor to Lange International S. A., Switzerland

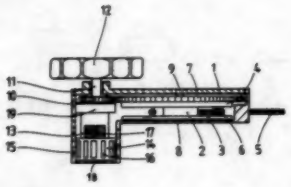
Filed Sep. 20, 1989, Ser. No. 410,321

Claims priority, application Switzerland, Nov. 9, 1988, 4163/88

Int. Cl.[5] A43B *5/04*; A43C *11/00*; B65H *75/48*

U.S. Cl. 242—54 R **8 Claims**

1. A cable tensioner with a winding drum for a ski boot, comprising, in a housing (1; 28), a winding drum (2; 25) equipped with a toothing (7; 32) a rotatable external handle (12; 27) shiftable axially counter to the action of a spring, and a non-return device (10, 13, 14; 29, 30) preventing the drum from rotating in the unwinding direction, this non-return device being cancellable as a result of pressure on the handle, wherein the cancellable non-return device is composed of a set of movable elements (10, 13, 14; 29, 30), one (10; 29) of which meshes



with the toothing of the winding drum, one (10; 30) of these movable elements also being driveable in rotation by said external handle for driving the winding drum.

4,961,545

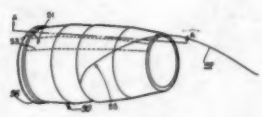
DEEP NESTED FILAMENT WINDING

George W. LeCompte, Tucson, Ariz., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 69,353, Jul. 2, 1987, abandoned. This application Feb. 6, 1989, Ser. No. 307,246

Int. Cl.[5] B65H *49/02, 55/04, 75/14*

U.S. Cl. 242—54 R **6 Claims**

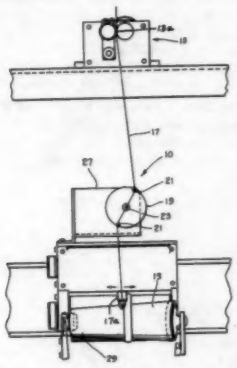


1. A method of forming a winding of filament comprising the steps of:
providing a spool having a center post and at least a first radially projecting flange,
wrapping said filament onto said spool center post such that said filament advances axially with respect to said center post to provide a total pitch distance of approximately 1.732 times the diameter of said filament, said filament advancing axially in a first axial direction with respect to said center post and then reversing to advance in a second axial direction with respect to said center post, said wrapping step continuing by alternately reversing the axial advancement of said filament to define a plurality of filament layers, said layers of said filaments having filament segments which contact said first flange,
providing a second radially projecting flange and wrapping said filament onto said spool such that said layers of said filaments have filament segments which contact said second flange, and
removing said second flange, thereby enabling said filament to be payed out when pulled axially with respect to said winding.

4,961,546
STRAND TENSION COMPENSATOR

Richard N. Ryer, II, Easley, and Fetta, Jeffrey E., Central, both of S.C., assignors to Platt Saco Lowell Corporation, Greenville, S.C.

Filed Sep. 29, 1989, Ser. No. 417,956
Int. Cl.[5] B65H *59/26*
U.S. Cl. 242—154 7 Claims



1. A tension compensator for use intermediate means delivering a strand at an approximately constant speed and a package upon which said strand is wound at a varying rate along the length of the package comprising:

an electric actuator;

a member attached to said actuator for varying the distance in which said strand must travel between said delivery means and said package;

a sensor for monitoring the position of said member;

electronic means for comparing the actual position of said member with a predetermined home position and thereby generating an error signal; and

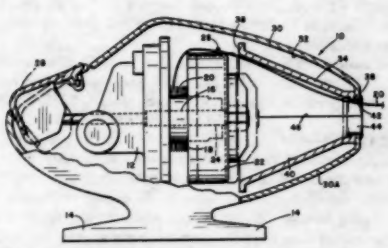
said electronic means further comprising controller means receiving the error signal input and driving said actuator toward said home position;

whereby approximately constant tension in said strand is maintained.

4,961,547
CLOSED FACE FISHING REEL HAVING SPEED CONE

Robert J. Peterson, Claremore; Thomas G. Kirby, Broken Arrow, both of Okla., assignor to Swede Industries, Inc., Claremore, Okla.

Filed Jun. 12, 1989, Ser. No. 365,256
Int. Cl.[5] A01K *89/01*
U.S. Cl. 242—238 13 Claims



1. A closed face fishing reel comprising:

a reel body and means for attachment to a fishing rod, the body having a forward end and a rearward end;

a spool means supported to the reel body having a spool axis, a forward end and a rearward end;

means for winding fishing line onto said spool means, such winding means being rotatable about the axis of said spool means;

a cone means supported relative to said reel body adjacent to and forwardly of said spool means, the cone means having a rearward end of a diameter at least as large as said spool means and a smaller diameter forward end, and an opening therethrough providing a smooth interior circumferential surface forming a line confining envelope that is co-axial with said spool axis;

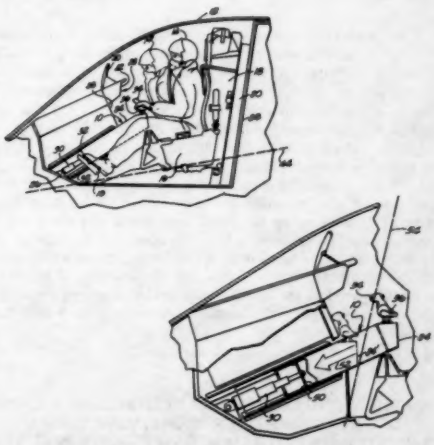
said fishing line having a portion thereof wound on said spool and the free end extending past said winding means and said spool means and through said cone means from the rearward through the forward end thereof; and

an outer housing removably supported relative to said reel body, said outer housing encompassing and spaced from said cone means, said outer housing having a forward opening therein co-axial with said opening of said cone means.

4,961,548
TRANSLATING CENTER CONTROL SYSTEM

William Adams; R. H. DellaRovere, both of Torrance, and Barbara G. J. Courter, El Segundo, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 21, 1988, Ser. No. 288,502
Int. Cl.[5] B64C *13/06*
U.S. Cl. 244—118.5 3 Claims



1. A flight management console for an air vehicle in which a g-tolerance increasing forward lean posture is utilized comprising:

(a) an elongated, center-mounted pedestal connected at a first end to a rigid support structure located forward and below the front instrument panel of the vehicle capable of translating up and aft or down and forward relative to said front instrument panel, said center-mounted pedestal being positioned forward of an associated seat along a plane which bisects said associated seat and is parallel to the pitch plane of the vehicle;

(b) primary flight controls mounted on a second end of said pedestal, said primary flight controls including a flight control stick and throttle/thrust controller; and

(c) adjustment means for securely and selectively positioning the pedestal at a desired location along said plane which is parallel to said pitch plane, said console thereby providing maximum adjustment for pilot anthropometric accommodation and continuous contact with the primary flight controls during critical portions of a mission, thereby permitting the pilot a degree of self support in high g maneuvers by allowing the pilot's forearms and elbows to

brace against his knees and thighs while in a forward lean posture.

4,961,549

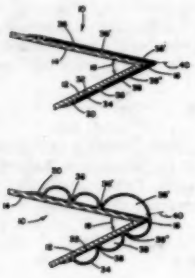
ASYMMETRICAL PNEUMATIC DEICER

Albert M. LaRue, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 726,574, Apr. 24, 1985, abandoned. This application Sep. 1, 1989, Ser. No. 403,913

Int. Cl.[5] B64D *15/18*

U.S. Cl. 244—134 A 13 Claims



1. A pneumatic deicer applied upon an aircraft component wherein a pair of essentially flat surfaces of the component join to define a component wedge profile, the wedge profile being configured to establish a leading edge of the component, the deicer comprising an inner layer affixed to the leading edge and an outer distensible layer joined to said inner layer which together define at least one pneumatically inflatable tubular structure, the tubular structure having a length and width, the length being oriented generally parallel to the leading edge, said one inflatable tubular structure being affixed with length parallel to the leading edge and asymmetrically covering the leading edge, at least about 55% but not more than about 75% of the width of the tubular structure being positioned upon one of the essentially flat surfaces and the balance of the width wrapping around the leading edge and being positioned upon the other essentially flat surface when uninflated and when inflated.

4,961,550

METHOD AND DEVICE FOR PROTECTING A LIQUID ROCKET BOOSTER FROM IMPACT AND ENVIRONMENTAL DAMAGE TO PERMIT RECOVERY AND REUSE

Edward J. Hujsak, La Jolla, Calif., assignor to General Dynamics Corporation, Convair Division, San Diego, Calif.

Filed Jan. 26, 1989, Ser. No. 301,774

Int. Cl.[5] B64D *45/00*

U.S. Cl. 244—138 R 7 Claims

1. A method of recovering a liquid propellant rocket booster having a rocket engine and turbopump for recovery and reuse after launch, comprising:

deploying a parachute means carried by the rocket booster after the booster has separated from an associated space vehicle following launch so that the rocket booster is permitted to descend into a body of water in nose down attitude;

providing on the aft end of the rocket booster cylindrical structural member that surrounds nozzles of the rocket engine to preclude crash damage to such nozzles when the rocket booster impacts the water;

deploying a flexible water impervious sleeve member from the aft end of the rocket booster prior to impact in the water, said flexible sleeve member collapsing upon its length as the booster floats in the water to preclude migration of the water into the rocket engine and turbopumps.

4,961,551

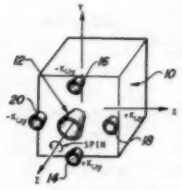
STABILIZATION OF A SPINNING SPACECRAFT OF ARBITARY SHAPE

Harold A. Rosen, Santa Monica, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 18, 1988, Ser. No. 272,858

Int. Cl.[5] B64G *1/24*

U.S. Cl. 244—164 5 Claims



1. A stabilization system, for a spinning spacecraft, for providing rotational stability about an axis of rotation, comprising:

measuring means for detecting angular rates of motion along first and second orthogonal axes mutually perpendicular to said axis of rotation and for providing error signals proportional to said angular rates;

a first pair of control thrusters for providing positive and negative moments about said first axis;

a second pair of control thrusters for providing positive and negative moments about said second axis;

control means for firing one of said first pair of control thrusters in response to said error signals about said first axis and for firing one of said second pair of control thrusters in response to said error signals about said second axis, whereby said spacecraft is maintained in stability; and,

wherein said spacecraft has a main thruster for orbit transfer and each of said control thrusters produce thrust acting in the direction of thrust of said main thruster.

4,961,552

FAST EARTH RECOVERY PROCEDURE FOR EARTH-POINTING SATELLITES

Aneurin G. Bird, Katwijk, and Leopold C. Van Holtz, Aerdenhout, both of Netherlands, assignors to Agence Spatiale Europeenne, France

Continuation of Ser. No. 69,013, Jul. 1, 1987, abandoned. This application Oct. 24, 1989, Ser. No. 427,902

Claims priority, application France, Jul. 4, 1986, 86 09727

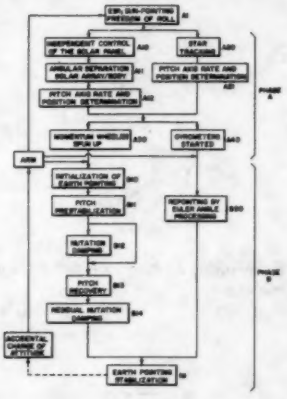
Int. Cl.[5] B64G *1/38*

U.S. Cl. 244—165 17 Claims

1. An earth recovery procedure for a nominally earth-pointing satellite of the dual spin type, said satellite having a body; a solar array with solar panels; direction reference means belonging to a group comprising a sun sensor, an earth sensor and a rate gyrometer; pitch servo control means, and roll servo control means; and attitude correction means belonging to a group comprising momentum wheels and thrusters, for altering satellite attitude; said procedure comprising the following steps commencing with a selected one of the steps, including the steps subsequent to the selected step, and including at least the last two steps:

(i) an initialization step comprising deactivating the servo loop of said roll servo control means, connecting all said sun and earth sensors and/or rate gyrometers, and assuming open-loop control of attitude using said attitude correction means;

(ii) a pitch pre-stabilization step comprising placing the satellite in the dual spin configuration, with counter-rotating body; responding to signals from said sun and earth sensors to determine pitch movement; and controlling the pitch movement using said attitude correction means to



bring the pitch rate within the operating limits of said pitch servo control means by earth capture in pitch with single axis control;

(iii) a pitch recovery step comprising activating the pitch servo control means for controlling the pitch movement of the satellite; and

(iv) a residual nutation damping step comprising exerting transverse roll/yaw torque by action on said momentum wheels and/or thrusters until earth capture by said roll servo control means.

4,961,553

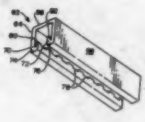
SUPPORT SYSTEM FOR PIPES AND OTHER LOADS

George R. Todd, 18333 NE. 146th, Woodinville, Wash. 98072

Filed Oct. 3, 1988, Ser. No. 252,855

Int. Cl.[5] F16L *3/08*

U.S. Cl. 248—62 **10 Claims**



1. A support system comprising: an elongated channel and a component for attaching a load to said channel, said channel being fabricated of a rigid, vibration abosorbing, non-metallic, engineered polymer and having: segments of different thicknesses; a pair of spaced apart, parallel side walls; a back wall spanning and oriented at a right angle to said side walls; and a flange which is spaced inwardly from each of said side walls, said load attaching component having an element thereof trapped in said channel, said element of said load attaching component extending far enough from one toward the other of the side walls of the channel to keep the load attaching component from shifting from side to side in the channel to any substantial extent, and said flanges and the trapped element of said load attaching component having interengageable means providing a positive connection between said channel and said component and thereby keeping said component and said load from slipping relative to said channel, those of the interengageable means associated with said channel being oppositely positioned, paired notches of like dimensions formed in and opening onto the free edges of said flanges at intervals therealong; there being a series of notches in each of said flanges; all of said notches being of the same dimensions and configuration; the spacing between successive notches in each series thereof being the same; and the trapped element of the load attaching component being configured to complement the notches in the flanges of the system's channel and thereby keep the load attaching component from shifting along said channel in the longitudinal direction irrespective of the pair of notches in which the aforesaid element of the load supporting component may be trapped.

4,961,554

FASTENER

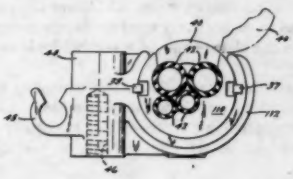
Mark Smowton, Chelmsford, United Kingdom, assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 27, 1988, Ser. No. 211,605

Claims priority, application United Kingdom, Jul. 18, 1987, 8717012

Int. Cl.[5] F16L *3/22*

U.S. Cl. 248—68.1 **8 Claims**



1. A fastener for securing together a plurality of elongate members and for attaching said plurality to a structure, the fastener comprising:

(a) a first body having (i) a cylindrical circumference, (ii) a plurality of bores extending through said first body and adapted to accommodate said elongate members, the longitudinal axis of each of said bores being orthogonal to said cylindrical circumference of said first body, each one of said bores being accessible from the circumference through an access passage, and (iii) at least one retaining clip extending axially from said first body parallel to the longitudinal axis of said bores, said at least one retaining clip adapted to provide a limited degree of axial movement of said first body;

(b) a second body having (i) a cylindrical recess and (ii) a supporting member by which the second body is attachable to said structure, said first body being rotatably received in said cylindrical recess of said second body; and

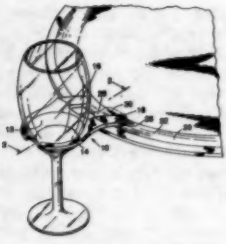
(c) a gate at said access passage which can be opened while said first body is in said cylindrical recess of said second body to allow radial ingress and egress of said elongate members to and from said bores.

4,961,555

GLASS HOLDER

Edward J. Egan, Jr., Pasadena, Calif., assignor to West Coast Container, Huntington Park, Calif.

Filed Sep. 11, 1989, Ser. No. 405,646
Int. Cl.[5] A47G *21/00*
U.S. Cl. 248—231.8 **7 Claims**



1. A clip-on stemware holder comprising:

bowl shaped means for holding stemware, said bowl shaped means including a flange circumferentially disposed about and extending radially outwardly from said bowl shaped means;

a pair of laterally-spaced upper clip elements extending from said flange and adapted to supportively and frictionally engage the upper surface of the rim of a plate upon which said holder is to be mounted;

a lower clip element attached to and extending downwardly and then outwardly from said flange of said bowl shaped means, said lower clip element being positioned substantially parallel to said upper clip elements and spaced therebeneath a selected amount, said lower clip element being circumferentially disposed in the space between said spaced upper clip elements, said lower clip element being adapted to supportively and frictionally engage the lower surface of a plate upon which said holder is to be mounted; and

means underlaying said flange and extending between and connected to said bowl shaped means and the downwardly extending portion of said lower clip element for bracing said lower clip element to said bowl shaped means.

4,961,556

PORTABLE DRAFTING TOOLS HANGER

Hector M. Sosa, 7311 SW. 132 Ave., Miami, Fla. 33183

Filed Mar. 13, 1989, Ser. No. 322,366
Int. Cl.[5] A47F *5/00*
U.S. Cl. 248—314 **7 Claims**

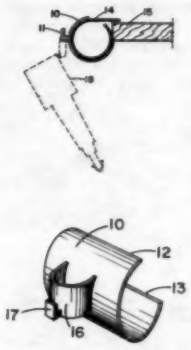
1. A hanger, in combination with a drafting table, particularly holding a cylindrical paper protector attached to an edge for supporting drafting tools and more particularly an electric eraser, which comprises:

(a) a member having an arcuate portion shaped as a partial cylinder, with holding means extending therefrom;

(b) said arcuate portion being C-shaped in cross section and having an inside diameter that generally correspond to the outside diameter of the cylindrical paper protector;

(c) said arcuate portion terminating at a pair of opposed ends which define a space for inserting said hanger onto the cylindrical paper protector; and

(d) said holding means extending radially outwardly from the periphery of said arcuate portion, and comprising



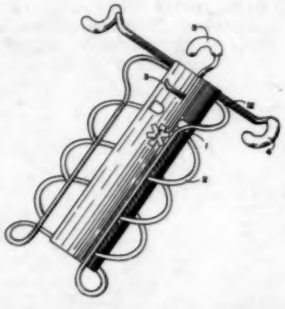
means for supporting drafting tools and more particularly and electric eraser.

4,961,557

I.V. BAG STABILIZER

Henry M. Garvin, P.O. Box 756, and Christopher M. Horsley, 525 Recold Rd., both of Walterboro, S.C. 29488

Filed Aug. 2, 1989, Ser. No. 395,709
Int. Cl.[5] A47H *1/10*
U.S. Cl. 248—318 **2 Claims**



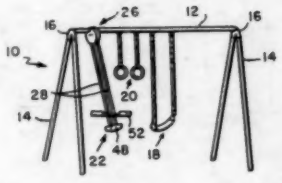
1. A device for stabilizing an intravenous solution bag comprising a rigid element having two ends, two sides, a front and a back; a plurality of rib members extending from the sides outwardly and inwardly defining a cradle for the intravenous solution bag; a means for hanging the intravenuos solution bag; and clamnping means for securing the device to a support; wherein the clamping means comprises a bar element secured to one end of the rigid element having padded hooks at the ends of the bar, and a lever and fulcrum type clamp attached to the back of the rigid member via tab means.

4,961,558

PLAY GYM HINGE GUARD

Joel C. Canard, Bedford, Pa., assignor to Hedstrom Corp., Bedford, Pa.

Filed Jan. 31, 1989, Ser. No. 304,500
Int. Cl.[5] A47B 96/06
U.S. Cl. 248—370 8 Claims



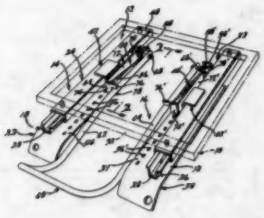
1. A protective cover for a glide ride swing of the type including a pair of tubular hangers and a bracket for pivotally connecting the upper ends of the hangers to a play gym crossbar, said cover including a pair of similar, relatively rigid weather-resistant plates, each plate having an integral orthogonal flange extending around its periphery; means defining an opening near an upper edge of each plate for receiving the play gym crossbar; means defining recesses in the opposing surfaces of said plates for accommodating the pivotal connections between the hangers and the bracket; means for releasably attaching the plates to opposite sides of the glide ride bracket so that the plate extends appreciably beyond the hangers and below the bracket, said attaching means including a first pair of vertically elongated holes in each plate on opposite sides of the opening therein for receiving a pair of threaded fasteners.

4,961,559

LATCHING BAR ARRANGEMENT FOR SEAT ADJUSTER

Robert B. Raymor, Walled Lake, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 18, 1989, Ser. No. 451,835
Int. Cl.[5] F16M 13/00
U.S. Cl. 248—429 2 Claims



1. A seat support structure for a vehicle comprising a pair of laterally spaced apart inboard and outboard track assemblies for mounting the seat structure on the vehicle providing horizontal fore and aft movement to a plurality of adjusted positions, said inboard and outboard track assemblies comprising a pair of inboard and outboard stationary track means fixed to the vehicle each having a respective series of longitudinally spaced lock openings therein, a pair of inboard and outboard movable track means each having a forward end portion and an aft end portion and slidably mounted on an associated one of said inboard and outboard stationary track means, a seat adjustment dual locking arrangement for said seat support structure inboard and outboard track assemblies comprising:

a generally U-shaped latch release lift bar symmetrically disposed intermediate said inboard and outboard track assemblies about a longitudinal axis of symmetry of said seat support structure, said lift bar comprising a pair of longitudinally extending inboard and outboard legs interconnected at their forward ends by a handle portion, said inboard leg having its aft free end rotatably connected by inboard pivot pin means to said inboard sliding track means aft end portion and said outboard leg having its aft free end rotatably connected by outboard pivot pin means to said outboard sliding track means aft end portion, said inboard and outboard pivot pin means aligned on a common transverse pivot axis;

a primary latch mechanism comprising a longitudinally extending detent bracket rotatably connected to said inboard pivot pin means, and inboard resilient means biasing said primary latch mechanism detent bracket in a fir rotational direction to a predetermined latched position;

said primary detent bracket having at least one inboard locking detent extending vertically therefrom such that with said inboard detent bracket in its predetermined biased position said inboard locking detent is adapted to engage one of said inboard lock openings;

a secondary latch mechanism comprising a longitudinally extending detent bracket rotatably connected to said outboard pivot pin means, and outboard resilient means biasing said secondary latch mechanism detent bracket in said first rotational direction to a predetermined latched position;

said secondary latch mechanism having at least one outboard locking detent extending vertically therefrom such that with said outboard detent bracket in its predetermined biased position said outboard locking detent adapted to engage one of said outboard lock openings;

and means connecting said inboard and outboard detent brackets with said lift bar inboard and outboard legs, respectively, such that upon said lift bar handle portion being rotated a predetermined distance in a second opposite rotational direction in opposition to said inboard and outboard resilient means said inboard and outboard bracket detents are rotated in unison therewith to their predetermined unlatched positions; and

whereby upon said lift bar handle portion being released from its unlatched position said inboard resilient means causing said lift bar and said inboard detent bracket to be rotated about said pivot axis in said first rotational direction wherein said inboard locking detent is engaged in one of said inboard lock openings locking said seat support structure in a longitudinally adjusted position, and whereby said outboard resilient means causing said outboard detent bracket to be rotated about said pivot axis in said first rotational direction wherein said outboard locking detent is biased into floating contact with said outboard stationary track means in the event that said outboard locking detent is misaligned with a corresponding outboard lock opening, such that said outboard biasing means operative to automatically engage said outboard locking detent in said corresponding lock opening upon subsequent tolerance compensating travel of said outboard movable track means.

4,961,560

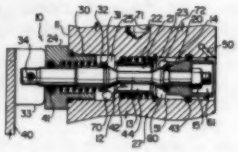
TWO WAY LATCHING TRIP VALVE

James R. Ellett, Edmonton, Canada, assignor to Bralorne Resources Limited, Alberta, Canada

Filed Mar. 18, 1988, Ser. No. 169,740
Int. Cl.[5] F16K 31/122
U.S. Cl. 251—63.5 4 Claims

1. A latching trip valve comprising a spindle longitudially movable within a housing, a lever rotatably connected to said spindle and operable to move said spindle longitudinally relative to said housing upon rotation of said lever, a pilot piston connected to said spindle, an O-ring between said piston and said spindle, a spring loaded floating seat movable relative to

said housing by said O-ring and said pilot piston, a passageway between said spindle and said floating seat, said passageway



being opened and closed by movement of said pilot piston relative to said floating seat.

4,961,561

SOLENOID VALVE

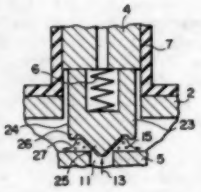
Isao Kamibayasi, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 387,043, Jul. 31, 1989. This application Feb. 16, 1990, Ser. No. 481,772

Claims priority, application Japan, Jul. 29, 1988, 63-191378; Jul. 29, 1988, 63-101284

Int. Cl.[5] F16K *31/06*

U.S. Cl. 251—120 **1 Claim**



1. A solenoid valve comprising:

a case (1) made of a magnetic material;

a bobbin (7) disposed within said case;

a solenoid coil (8) wound around said bobbin;

a stationary iron core (4) disposed at one end of said case and having one portion inserted into said bobbin from one end thereof;

a magnetic plate (2) disposed at the other end of said bobbin;

a magnetic plunger (23) axially movably disposed at the other end of said bobbin within a magnetic path between said magnetic plate and said stationary iron core, said plunger being capable of being attracted toward said stationary iron core upon energization of said solenoid coil;

a spring (6) for biasing said plunger away from said stationary iron core;

said magnetic plate dividing said magnetic case into two chambers, one containing said solenoid coil for driving said plunger and said spring and the other containing a valve opening closable by said plunger;

said plunger having a conical tip portion (25) which is insertable into said valve opening to close it, and a cylindrical portion (24) slidable within said magnetic plate, and means for impeding an accumulation of magnetic particles between a base of said plunger and said stationary iron core, said impeding means comprising a raised annular lip (26) surrounding a base of said conical tip portion for deflecting a fluid flow between said valve opening and said conical tip portion of the plunger away from said magnetic plate.

4,961,562

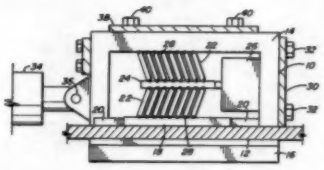
APPARATUS FOR ENGAGING BEAMS

Robert B. Donnally, 14806 Mesita, Houston, Tex. 77083

Filed Nov. 16, 1988, Ser. No. 272,720

Int. Cl.[5] B66F *1/00*

U.S. Cl. 254—106 **27 Claims**



1. An apparatus for selectively engaging a beam applying high loads which has two opposing surfaces, comprising:

a frame having a first end which faces one side of the beam and having a second end adjacent to the other surface of the beam;

a shoe located between the beam and the first end of said frame, wherein said shoe has a flat surface adjacent to the beam whereby load is distributed over a substantial area of the beam and has a second surface facing the first end of said frame;

at least one plate located between said shoe and the first end of said frame, wherein said plate is inclined at an acute angle relative to the second surface of said shoe; and

an actuator for moving said plate so that the acute angle between said plate and the second surface of said shoe increases and causes said shoe and the second end of said frame to engage the beam.

4,961,563

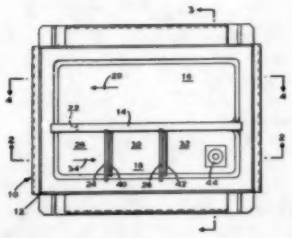
TUNDISH FOR INGOT POURING

Francis S. Suarez, Huntington, W. Va.; James E. Roberts, Proctorville, Ohio; Vinayak P. Kamdar; James R. Hyatt, both of Huntington, W. Va., and Lloyd A. Lowe, Catlettsburg, Ky., assignors to INCO Alloys International, Inc., Huntington, W. Va.

Filed Jun. 12, 1989, Ser. No. 364,149

Int. Cl.[5] C21B *3/00*

U.S. Cl. 266—229 **2 Claims**

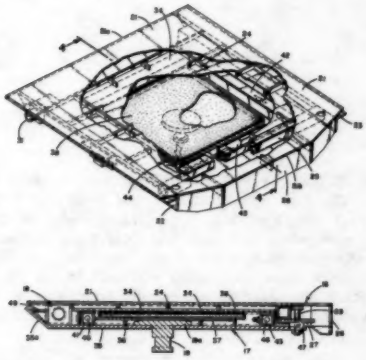


1. A tundish for teeming heats, the tundish comprising a container having sidewalls and a bottom, the container divided into a pair of adjacent first and second longitudinal compartments by a divider, the bottoms of the first and second longitudinal compartments of the container sloped in opposing directions for facilitating heat flow, an aperture disposed within the divider, the second longitudinal compartment subdivided into a plurality of sequential chambers, most of the chambers flowably disposed to receive the heat from an adjacent chamber, heat flow disturbing means disposed between at least some of the chambers, and one chamber including a nozzle.

4,961,564
AIR SUSPENSION APPARATUS

Leslie H. Schuit, Eagan, and Charles J. Tekautz, Jr., Tower, both of Minn., assignors to Tartan Transportation Systems, Inc., Edina, Minn.

Division of Ser. No. 104,828, Oct. 2, 1987, Pat. No. 4,861,060.
This application Jul. 18, 1989, Ser. No. 381,571
Int. Cl.[5] F16F *9/342;* B66F *3/24*
U.S. Cl. 267—64.22 12 Claims



1. Air suspension apparatus for large masses, comprising:
inflatable air bag means of predetermined external effective surface area and predetermined internal volume;
an air reservoir of predetermined internal volume;
and an air line connecting the air bag means to the reservoir, the air line having a predetermined cross sectional area;
the ratio of effective surface area of the air bag means to cross sectional area of the air line being at least as great as about 5,000.

4,961,565
METHODS AND APPARATUS FOR FOLDING TEXTILE MATERIALS

Oskar Karolyi, Bad Boll, Fed. Rep. of Germany, assignor to Michael Hörnuf Maschinenfabrik GmbH & Co. KG, Donzdorf, Fed. Rep. of Germany

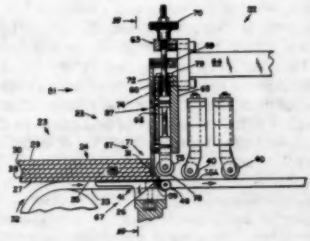
Filed Sep. 7, 1988, Ser. No. 241,237
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1987, 3733816
Int. Cl.[5] B42C *1/00*
U.S. Cl. 270—45 21 Claims

1. An apparatus for folding pieces of textile material which have front and rear ends, said apparatus comprising:
a folder mechanism for folding each piece of textile material,
first conveyor means disposed upstream of said folder mechanism and including a prefolding table and first conveyor belt means movable around said prefolding table for supporting each piece of textile material thereon,
second conveyor means disposed downstream of and below said first conveyor means and upstream of said folder mechanism, said second conveyor means including an application table and second conveyor belt means movable around said application table and arranged for receiving each piece of textile material from said first conveyor belt means in a direction of conveyance, said second conveyor belt means being actuable to transfer said piece of textile material to said folder mechanism,
belt drive means for moving said first and second conveyor belt means around said prefolding table and said application table, respectively, for transferring the front end of a piece of textile material onto said second conveyor belt means to a location adjacent a downstream end of said second conveyor belt means, while the rear end of the piece of textile material remains disposed upstream of said second conveyor belt means, whereby said piece of textile material bridges said first and second conveyor belt means,
table drive means for effecting relative displacement between said prefolding table and said application table in said direction of conveyance to prefold the conveyor-bridging piece of textile material about a fold line located adjacent an upstream end of said second conveyor belt means sufficiently to reposition the rear end of said piece of textile material over said second conveyor belt means at a location adjacent the front end of the piece of textile material, whereby movement of said second conveyor belt means around said application table transfers the prefolded piece of textile material, including the front and rear ends thereof, to said folder mechanism.

4,961,566
APPARATUS FOR FEEDING SHEETS FROM A STACK OF SHEETS

Raymond A. Labombarde, deceased, late of Nashua, N.H. (by Ruth N. Labombarde, Nashua Trust Company, executors), both of Nashua, N.H. assignor to International Paper Box Machine Co., Inc., Hillsborough, N.H.

Filed Nov. 14, 1986, Ser. No. 931,406
Int. Cl.[5] B65H *3/04*
U.S. Cl. 271—35 16 Claims



1. Apparatus for selectively feeding sheets from a stack of sheets in sequence along a paper line through a feeding zone comprising:
at least one forwardly driven endless carrier belt, having an upper reach being parallel to the paper line and having a gripper surface for advancing the sheets individually and sequentially along the paper line;
vertically actuated feed gate operable between a first and second opening position to allow only the lowermost sheet to advance through gaps formed when the gate is in the said opening positions;
means for controlling the gap between the feed gate and the gripper surface of the carrier belt of the first opening position;
means for controlling the gap between the feed gate and the stack lifter means of the second opening position;
stack lifter means which moves sequentially in a vertical

path above and below the gripper surface to lift and lower the stack of sheets onto and out of engagement with the gripper surface whereby the lowermost sheet engages the gripper surface when the stack lifter means is moved below the gripper surface to advance a portion of the lowermost sheet through the first opening position; and

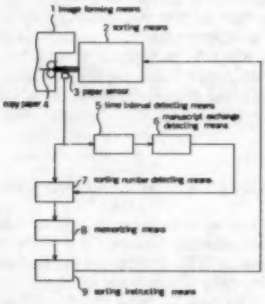
means to form a second predetermined opening position between the height of the lifter means and feed gate when the said lifter means and feed gate move above the gripper surface through which the remaining portion of the sheet advances.

4,961,567

SORTING APPARATUS

Mitsugu Shibanaka, Sakai, Japan, assignor to Mita Industrial Co. Ltd., Osaka, Japan

Filed Mar. 7, 1989, Ser. No. 319,682
Claims priority, application Japan, Mar. 14, 1988, 63-59646
Int. Cl.[5] B65H *39/10*
U.S. Cl. 271—293 **2 Claims**



1. A sorting apparatus comprising;

a sorting means for sorting one by one image media discharged from an image forming apparatus,

a paper sensor for detecting said discharged image media,

a time interval detecting means for detecting each time interval at least between image media of a first manuscript and between a first manuscript and a second manuscript on the basis of the output of said paper sensor,

a manuscript exchange detecting means for detecting exchange of a first manuscript of said image forming apparatus on the basis of the time interval detected by said time interval detecting means,

a sorting number detecting means for detecting a sorting number on the basis of both said detected exchange of the manuscript and the output of said paper sensor,

a memorizing means for memorizing the detected sorting number, and

a sorting instructing means for instructing said sorting means to sort the image media with regard to the second and subsequent manuscripts on the basis of said memorized sorting number.

4,961,568

EXERCISING AND STRETCHING A PERSON'S FINGER JOINTS

Douglas W. Clark, P.O. Box 96952, Las Vegas, Nev. 89193, and Steven Zabel, Las Vegas, Nev., assignors to Douglas W. Clark, Las Vegas, Nev.

Filed Apr. 4, 1989, Ser. No. 332,725
Int. Cl.[5] A63B *21/07*
U.S. Cl. 272—68 **3 Claims**

1. Apparatus for exercising and stretching a person's finger joints comprising:

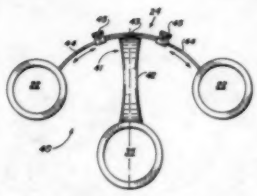
a first finger receptacle;

a second finger receptacle;

a thumb receptacle,

all said receptacles lying generally in a plane,

a length adjustable, flexible, finger separation bridge coupling said first and said second finger receptacle, lying in said plane with said receptacles, and permitting flexure of the joints of a person's fingers when received by said receptacles;



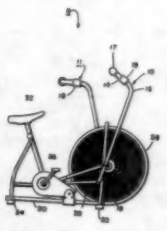
a shaft coupling said thumb receptacle centrally to said length adjustable, flexible, finger separation bridge for positioning a person's thumb generally between a person's fingers when the thumb and fingers are inserted in the respective receptacles of the apparatus, said first and second finger receptacles and said thumb receptacles being positioned in a generally triangular relationship with one of said receptacles at each apex of the triangle so defined.

4,961,569

ARM LEVERS FOR TOTAL EXERCISE STATIONARY CYCLES

Raymond F. Roberge, 169 Medway Rd., Apt. 4, Milford, Mass. 01757

Filed Jun. 12, 1989, Ser. No. 364,099
Int. Cl.[5] A63B *21/00*
U.S. Cl. 272—73 **5 Claims**



1. An arm lever for a total exercise stationary cycle, said arm lever comprising:

a. an elongated L-shaped tubular rod having a bottom end for connection to a pedalling mechanism on said total exercise stationary cycle, an intermediate portion for pivotal mounting on a frame on said total exercise stationary cycle and a top end;

b. a handle having an end;

c. one of said handle and said elongated L-shaped tubular rod having a plurality of holes; and

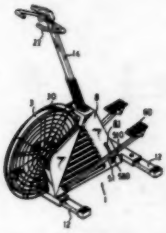
d. means for pivotally connecting said end of said handle to the top end of said elongated L-shaped tubular rod such that said handle is axially aligned with said elongated L-shaped tubular rod and can be pivotally moved about the longitudinal axis of said elongated L-shaped tubular rod, said means comprising a tubular member fixed to one of said handle and said elongated L-shaped tubular rod and rotatably mounted on the other one of said handle and said elongated L-shaped tubular rod, and a locking mecha-

nism for locking said handle at any one of a plurality of different positions, said locking mechanism comprising a type of hole engaging means.

4,961,570
EXERCISING MECHANISM FOR SIMULATING CLIMBING A LADDER

Chester Chang, No. 1-5, Chun Ting Lane, Ya Tan Road, Ta Ya Hsiang, Taichung Hsien, Taiwan

Filed Nov. 8, 1989, Ser. No. 433,549
Int. Cl.[5] A63B *21/00*
U.S. Cl. 272—73 **2 Claims**

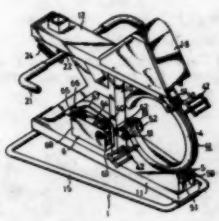


1. An exercising mechanism comprising generally a frame body having a handle provided on a top end thereof; a resistance wheel rotatably provided on said frame body; a driving mechanism including a pair of rocker arms pivoted on each side of said frame body, a crank having two crank arms being pivotally provided on said frame body, a driving gear fixed onto a crank shaft of said crank, coupling rod being pivotally connected between a free end of each said crank arm and each said rocker arm so that said driving gear is actuated to rotate by an up and down movement of a free end of each said rocker arm; a transmission mechanism being coupled between wheel and said driving mechanism; said transmission mechanism including a driven gear rotatably provided on said frame body for engagement with said driving gear of said driving mechanism, an intermediate gear being fixed to and coaxial with said driven gear, a pinion fixed onto an axle of said wheel, and a coupling element being coupled between said pinion and said intermediate gear; so that a user of said exercising mechanism may step on said free ends of said rocker arms so as to simulate climbing up a ladder.

4,961,571
EXERCISING APPARATUS

Tsai-Lain Lin, No. 27, Alley 2, Lane 437, Pei Twen Rd., Taichung, Taiwan

Filed Jan. 29, 1990, Ser. No. 471,404
Int. Cl.[5] A63B *22/00*
U.S. Cl. 272—73 **4 Claims**

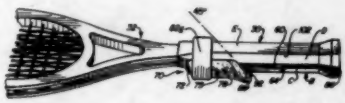


1. An exercising apparatus comprising a frame body including a lower beam and an upper beam fixed together by a post; a seat being provided on a rear end of said upper beam; at least three roller sets fixed on said frame body; and axleless wheel rotatably and solely supported by said roller sets and inscribed in said roller sets; said roller sets evenly, circumferentiatlly distributed around a peripheral surface of said wheel; two pedals fixed on respective perimeter sides of said wheel and 180 degrees apart; said wheel rotatably engaged with said roller sets in frictional relationship; and an energy absorbing mechanism coupled to one of said roller sets.

4,961,572
GRIP GUIDE FOR TENNIS RACQUET

Paul Badillo, 4380 Perry St., Denver, Colo. 80212, and Ronald M. Kronenberger, 731 S. Plymouth Ct., Chicago, Ill. 60605

Continuation of Ser. No. 122,175, Nov. 18, 1987, abandoned, which is a continuation of Ser. No. 760,270, Jul. 29, 1985, abandoned. This application Jul. 3, 1989, Ser. No. 374,949
Int. Cl.[5] A63B *49/00*
U.S. Cl. 273—75 **10 Claims**



1. A grip guide for positioning on a tennis racquet handle which comprises:

(a) an elongated shell having a longitudinally aligned concave undersurface and a longitudinally aligned outer surface, said shell including a central longitudinal axis, a first side portion, and a second side portion, said first and second side portions lying on opposite sides of said longitudinal axis, said side portions extending laterally outward from said central axis, one on each side of the axis to form said concave undersurface, said elongated shell having a forward end and a back end; and

(b) means for securing said elongated to said racquet handle,

said elongated shell terminating at its said forward end in a guide surface in the approximate shape of a rounded "V" having two arms, said two arms slanting away from said forward end of the elongated shell in opposite lateral directions on either side of said longitudinal axis, with the bottom of said rounded "V" being configured to extend in the opposite direction from said back end of the elongated shell,

said guide surface in the approximate shape of a rounded "V" at the forward end of the elongated shell being free of any projection extending in the forward direction away from said guide surface, and

said longitudinally aligned outer surface of the elongated shell being free of any elongated depressions oriented transverse to said central longitudinal axis of the shell,

whereby when said grip guide is positioned securely on said racquet handle in a predetermined location, it indicates to the player using the racquet the proper position of the hand on the racquet handle in order to make a given type of shot most effectively, and substantially the entire surface of said racquet handle between said guide surface at the forward end of said elongated shell and the free end of the racquet handle is free of any obstruction to rotation of the player's hand from one position on the handle to another.

4,961,573
BOXING EXERCISE HARNESS

Michael A. Wehrell, 2648 Strand, Hermosa Beach, Calif. 90254

Filed Jul. 25, 1988, Ser. No. 223,623
Int. Cl.[5] A63B *21/55*
U.S. Cl. 272—76 **21 Claims**

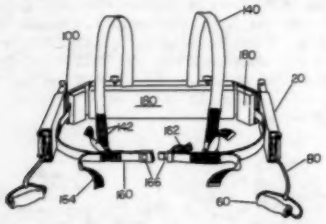
1. An exercise harness comprising:

a back member with means for attachment to the back of a user, said back member having a rigid frame and plural plates slideably connected to said rigid frame for adjusting the end-to-end length of said back member to conform to the armpit-to-armpit width of the back of a user;

two underarm members hingedly connected to the distal ends of said back member, each of said underarm members having means to adjust its end-to-end length to conform to the back-to-armpit width of the side of a user;

two hand grips extending forwardly from said underarm members;

one or more elastic members each having at least one distal



end affixed to one of said grips for providing a force opposing movement of said grips, said elastic members having a length whereby said force is relatively constant over a predetermined range of motion of said grips; and

plural low friction members affixed to said back and underarm members forming a path for said elastic members, said path having an end adjacent the armpit of a user, whereby said force is directed toward the armpit of a user.

4,961,574

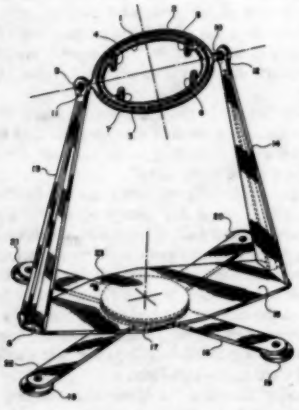
EXERCISER FOR AERIAL MANEUVERS

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Filed Oct. 30, 1989, Ser. No. 429,158

Int. Cl.[5] A63B *26/00*; A63G *31/00*

U.S. Cl. 272—109 **8 Claims**



6. An apparatus for acrobatic exercising comprising in combination:

(a) first and second rings disposed coaxially coplanarly in a retaining and rotatable arrangement therebetween wherein the first ring is rotatable relative to the second ring about a first axis coinciding with the central axis of the first ring and the first ring includes fastening means for securing a harness disposed within the first ring;

(b) a frame with a base structure having swivel means for supporting the second ring in a rotatable arrangement about a second axis generally perpendicular to the first axis, wherein the combination of the first and second rings is rotatable about the second axis; and

(c) a harness including a belt securable around the lower torso of a person and a pair of thigh straps securable around thighs of the person, wherein said harness includes fastening means for securing the harness to the fastening means included in the first ring.

4,961,575

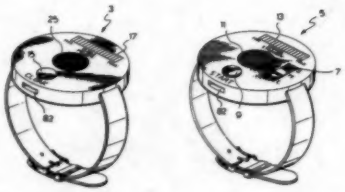
HIDE AND SEEK GAME

Stephen J. Perry, 38 Earl Street, Unit #10, Toronto, Ontario, Canada (M4Y 1M3)

Filed Apr. 27, 1989, Ser. No. 343,669

Int. Cl.[5] A63H *5/00*

U.S. Cl. 273—1 E **16 Claims**



1. Apparatus for playing an enhanced game of hide and seek, comprising:

a) a plurality of portable transmitter means adapted for being carried by a corresponding number of individuals in hiding, for generating respective output signals each contributing to an output signal field in the vicinity of said transmitters,

b) portable receiver means adapted for being carried by a further individual seeking to locate said individuals in hiding, for measuring field strength of said output signal field and in response generating a further signal representative of relative proximity to respective ones of said transmitter means,

whereby generation of said further signal assists said further individual in locating said individuals in hiding,

c) first circuit means included in each of said transmitter means for selectively disabling generation of said respective output signals, whereby disabling generation of said respective output signals assists said individuals in hiding to avoid being located by said further individual, and

d) second circuit means included in each of said transmitter means for measuring duration of said disabling generation of said respective output signals, and in the event said duration exceeds a predetermined length of time then disabling said first circuit means, whereby said individuals in hiding are prevented from permanently disabling generation of said respective output signals.

4,961,576

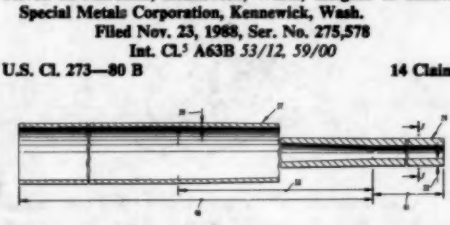
CONSTANT WALL SHAFT WITH REINFORCED TIP

Steven E. Meredith, Kennewick, Wash., assignor to Sandvik Special Metals Corporation, Kennewick, Wash.

Filed Nov. 23, 1988, Ser. No. 275,578

Int. Cl.[5] A63B *53/12*, *59/00*

U.S. Cl. 273—80 B **14 Claims**



5. A hollow metal shaft for sporting implements comprising:

a cylindrical tip section at least a substantial portion of which having a first constant wall thickness, said substan-

tial portion located generally towards a first end portion of said shaft,

a shank section including a tapered portion having a smooth peripheral tapered outer diameter which narrows toward said cylindrical tip section, said tapered portion having a second constant wall thickness, said tapered portion terminating at said cylindrical tip section,

an outer diameter of said cylindrical tip section being no larger than a smallest outer diameter of said tapered portion,

said first constant wall thickness being greater than said second constant wall thickness.

4,961,577

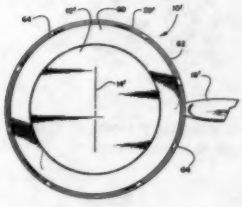
ORBITAL SPINNER

Paul Gebert, 4 Benham Cir., Cartersville, Ga. 30120

Filed Jun. 27, 1989, Ser. No. 371,922

Int. Cl.[5] A63B *67/14*

U.S. Cl. 275—109 **10 Claims**



1. An apparatus, comprising:

a base member having a surface;

an orbital pathway on said surface of said base member and being rotatable relative to said base member;

a handle attached to said base;

a rotatable top member; and

a spindle attached to said top member and extending perpendicularly thereto and being of a size and configuration sufficient for riding in said orbital pathway as said top member rotates, the speed at which said top member rotates increasing in response to reciprocating movement of said handle.

4,961,578

MACHINE FOR DRAWING OF LOTTERY BALLS

Clotaire R. G. Chatean, 9, allee des Sapins, 94 420 Le Plessis Trevise, France

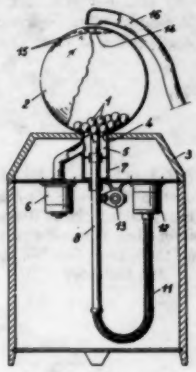
Filed Jun. 16, 1989, Ser. No. 367,040

Claims priority, application France, Jun. 24, 1988, 88 08493; May 3, 1989, 89 05866

Int. Cl.[5] A63F *9/00*

U.S. Cl. 273—144 R **9 Claims**

6. An apparatus for the random selection of balls being agitated by a current of air, said apparatus comprising a transparent receptacle adapted to receive and contain said balls, an annular space positioned beneath and communicating with said receptacle, and a plurality of orifices disposed within said annular space and immediately below said receptacle, said orifices being defined by flaps which are capable of at least partially sealing said annular space, further wherein said annular space comprises a tube which is axially movable, said tube being connected to a vacuum source which may be sued to create a suction within said central tube, said tube having an internal diameter slightly greater than the diameter of said balls, said tube further comprising an upper part comprising means for preventing untimely introduction of a ball, means for



holding a captured ball towards the end of said tube, and means for evacuating said captured ball.

4,961,579

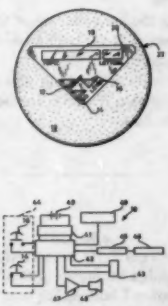
ELECTRONIC PUZZLE GAME

Barbara J. Thompson; Russell D. Bingham, and William Holmes, Jr., all of Knox County, Tenn., assignors to Tutor Toys, Inc., Knoxville, Tenn.

Filed Jan. 23, 1989, Ser. No. 300,965

Int. Cl.[3] A63F *9/00*; G09B *7/02*

U.S. Cl. 273—153 R **18 Claims**



8. A portable electronic puzzle game device useful for increasing a user's knowledge of vocabulary and words related to various word topics by causing said user to generate words related to a selected word topic, which comprises:

user input means for initiating operation of said device;

display means for visually depicting for said user a random one of said various word topics;

further display means for visually depicting for said user a plurality of random alphabetic letters as cues for responses to said displayed word topic; and

microprocessor means, including memory means, connected to said user input means and to said display means and further display means for generating a signal to said display means corresponding to said one of said random word topics and for generating a signal to said further

display means corresponding to said plurality of random alphabetical letters, said random word topics and said random alphabetic letters being stored in said memory means, whereby said user generates word responses to said displayed random word topic using said displayed random alphabetic letters as cues.

4,961,580

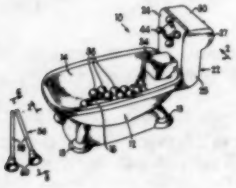
ROTATING BALL COLLECTING GAME

Craig S. Yoe, Croton-on-Hudson, N.Y.; Carol M. Rehtmeyer, Wheaton, and Harry Disko, South Barrington, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 8, 1989, Ser. No. 308,866

Int. Cl.[5] A63F 9/00

U.S. Cl. 273—1 GG **5 Claims**



1. An action game comprising in combination:
an open topped receptacle having a bottom;
a motor driven impeller adjacent the bottom;
a battery for providing power to the motor;
a plurality of balls;
means containing the balls outside of the receptacle;
means for the passage of the balls from the containing means into the receptacle; and
means simultaneously controlling passage of the balls from the containing means to the receptacle and power to the motor from the battery.

4,961,581

APPARATUS FOR PLAYING A GAME

David Barnes, and Alick M. Sharp, both of Wilberfoss, England, assignors to Rotation Limited, England

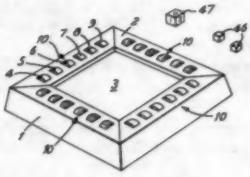
Filed Oct. 11, 1988, Ser. No. 256,026

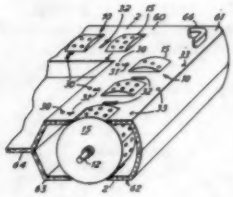
Claims priority, application United Kingdom, Oct. 23, 1987, 8724931

Int. Cl.[5] A63F 3/00

U.S. Cl. 273—236 **19 Claims**

1. Apparatus for playing a game comprising a support carrying at least two arrays of images, each image array comprising a set of at least three manually variable indicators which can be moved in relation to said support, said three manually variable indicators of each set being located one at each of three different peripheral locations upon said support in predetermined positional relationship to each other whereby each positional relationship of a first of said arrays corresponds to a positional relationship of a second of said arrays, at least three images arranged on each indicator, means for selectively generating indicia corresponding to at least each of said three locations and in response to which selected ones of said three images at selected ones of said three locations of each array can be displayed, and each indicator including means constructed and arranged for manual operation by a player for varying each indicator of only one set in relation to said support in response





to said location generating means to display selected ones of said three images at selected ones of said three locations.

4,961,582

GEOGRAPHICAL TRAVEL GAME

Stephen P. Van Lysel, 245 Swanton Rd., Apt. 6, Madison, Wis. 53714

Continuation-in-part of Ser. No. 198,935, Oct. 3, 1988, abandoned. This application Sep. 15, 1989, Ser. No. 408,182

Int. Cl.[5] A63F 3/04

U.S. Cl. 273—254 **1 Claim**

1. A board game comprising: a playing surface including a geographical map having designated thereon a plurality of countries and a plurality of cities;
a plurality of playing pieces for designating the positions of players on the playing surface;
a chance means for determining the movement of the playing pieces from one country to another country, said chance means having a plurality of different numbers and used for randomly selecting a number;

a plurality of city cards, every city on said map having a corresponding city card wherein when a player is positioned on a city, that player picks the corresponding city card;

a plurality of different sets of goal tokens, wherein one set of goal tokens has indicia representing a vacation activity and the other sets of goal tokens have different indicia representing different vacation activities;

each city card comprises a plurality of different instructions including instructions for receiving goal tokens, each instruction on each city card corresponds to a different number on said chance means wherein goal tokens are obtainable on certain number selections of the chance means, the first player receiving a predetermined number of goal tokens from each set being declared the winner.

4,961,583

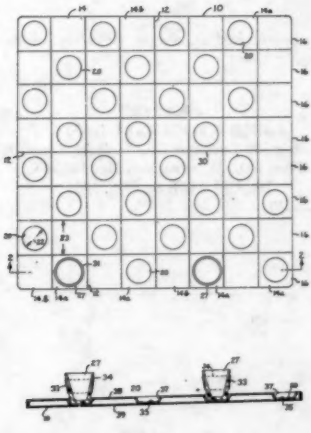
APPARATUS FOR PLAYING CHECKERS

Thomas P. Koch, 257 S. 1st St., and David N. Koch, 144 S. 5th St., both of Lehighton, Pa. 18235

Filed Nov. 13, 1989, Ser. No. 435,619

Int. Cl.[5] A63F *3/02, 3/00*

U.S. Cl. 273—260 **1 Claim**



1. Checker game apparatus comprising a game board having an upper face and a lower face; markings on the board upper face subdividing same into sixty four square spaces, arranged in eight parallel rows, eight squares per row; means coloring adjacent squares in contrasting colors;

said board upper face having circular recesses therein centered on the squares of a given color, making a total of thirty two recesses; each circular recess having a diameter less than the edge-to-edge dimension of the associated colored square;

twenty four identical hollow drinking glasses that serve as checkers; each drinking glass having a circular bottom wall having a diameter slightly less than the diameter of each circular recess, whereby the glass can be placed in any recess and moved from one recess to another during the playing of the checkers game;

each circular recess having a flat bottom surface and an annular frusto-conical side surface that angles upwardly and outwardly from said bottom surface;

each drinking glass comprising an upstanding circular annular transparent side wall extending upwardly from the aforementioned bottom wall to form a circular upper edge for the respective drinking glass; each transparent side wall having a height at least as great as the diameter of the associated circular bottom wall, whereby each drinking glass has a significant liquid capacity; each drinking glass having a colored band extending circumferentially around the surface of the annular transparent side wall a slight distance below the drinking glass upper edge; the upper edge of each colored band forming a liquid measuring line, whereby each glass can have the same quantity of liquid therein;

the annular bands on twelve of the glasses having one coloration, and the annular bands on the other twelve glasses having a different coloration, whereby the colored bands distinguish one player's checkers from the other player's checkers.

4,961,584

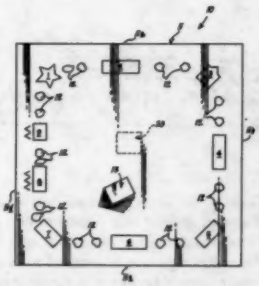
BOARD GAME APPARATUS

Grayling B. Day, Sr., 200 Springhill Rd. N., Fernandino Beach, Fla. 32034

Filed Jan. 25, 1990, Ser. No. 470,255

Int. Cl.[5] A63F *3/00, 7/30*

U.S. Cl. 273—357 **6 Claims**



1. A board game apparatus comprising a planar game board including a top playing surface, and the playing surface defining a first player side, a second player side, a third player side, and a fourth player side positioned in association with each side of the game board, and

the playing surface including a path of travel, the path of travel including positions adjacent the sides of the playing surface, the positions including a first position for collecting a projectile, a second drawing position, a third drawing position, a fourth safe position, a fifth drawing position, a sixth drawing position, a seventh drawing position, an eighth drawing position, and a ninth drawing position, and

a firing indicator means for directing a player to effect a drawing and firing maneuver against an opposing player indicated by the firing means, and

a first, a second, a third, and a fourth pistol member associated with each player to enable each player to effect a firing maneuver, and

a predetermined number of projectiles awarded each player defined by a first series of projectiles, a second series of projectiles, a third series of projectiles, and a fourth series of projectiles associated with each respective first, second, third, and fourth player, and

a target means for receiving projectiles by each of the players upon each of the players effecting a firing maneuver directed by the firing means.

4,961,585

FLYING TARGET WITH MARKER

Joe T. Crawford, 411 W. Beachwood, Rose City, Mich. 48654

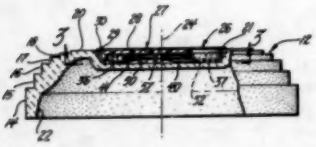
Filed Jul. 27, 1989, Ser. No. 385,819

Int. Cl.[5] F41J *9/16*

U.S. Cl. 273—363 **14 Claims**

14. A flying target comprising, in combination, a target disc

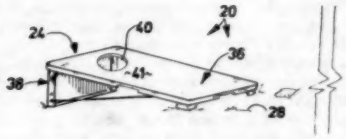
made of a material easily broken by pellet impact, a marker assembly for marking the location where said target disc is struck by pellet impact, and a retainer assembly for securing said marker assembly to said target disc until said target disc is struck by pellet impact and for releasing said marker assembly from said target disc when said target disc is struck by pellet impact so as to mark the location of said pellet impact, said target disc having upper and lower surfaces, said retainer assembly securing said marker assembly to said upper target disc surface, said retainer assembly including a film which substantially covers said marker assembly and is secured to said target disc at two or more points around the perimeter of said marker assembly whereby said marker assembly is retained between said target disc and said film until said target disc is at least partially broken by pellet impact and when said target disc is struck by pellet impact said film is separated from said target disc at least at one of said points, thereby permitting said marker assembly to separate from said target disc so as to mark

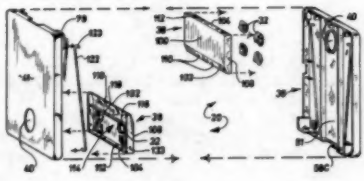


the location of said pellet impact, said marker assembly including a marker disc and at least one ribbon which is folded and positioned between said marker disc and said target upper surface, said ribbon having one end secured to said marker disc so that when pellet impact breaks said target disc said ribbon unfolds and steers said marker disc to the ground so as to mark location of said pellet impact, said ribbon including two ends, one of said ribbon ends being secured to said marker disc, said marker disc assembly including at least one weight attached to the other end of said ribbon to facilitate unfolding said ribbon when said film is separated at one of said points upon said target disc being broken by pellet impact, said marker assembly including a string and two weights, one of said weights being attached to said ribbon other end and the other of said weights being connected by said string to said ribbon other end whereby said other weight separates from said ribbon until said string is taught and then pulls said other weight on said ribbon through said string so as to facilitate unfolding of said ribbon.

4,961,586
BAG TOSSING GAME
David J. Conville, Hot Springs, Ark., assignor to Conlab, Inc., Hot Springs and Nancy Carver, Little Rock, both of, Ark.
Filed Feb. 14, 1990, Ser. No. 479,976
Int. Cl.[5] A63B *63/00, 67/00*
U.S. Cl. 273—402 **31 Claims**

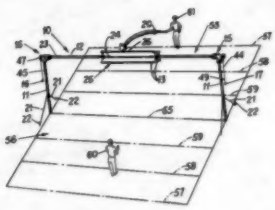
1. A portable tossing game for one or more players, said game comprising:
first and second target assemblies adapted to either be coupled to one another to dispose said tossing game in a transportable mode or to be separated and detached from one another to dispose said game in a playing mode;
a plurality of projectiles adapted to be tossed by players toward said target assemblies; and,
each of said target assemblies comprising:
a resilient playing board comprising an aperture penetrable by said projectiles, leg means projecting away from said board, and socket means defined in each playing board for mating with and receiving leg means emanating from the other playing board when said boards are fitted together; and,
elevator tray means associated with each playing board adapted to be selectively coupled thereto in either:
(i) a storage orientation snugly nested thereto; or,





(ii) an operational orientation elevating one end of said playing board.

4,961,587
PADDLE TOSS BALL GAME
Patrick J. Galvin, 39 Lynwood Dr., Wolcott, Conn. 06716
Filed Feb. 21, 1990, Ser. No. 482,764
Int. Cl.[5] A63B *67/00, 71/06*
U.S. Cl. 273—411 **6 Claims**



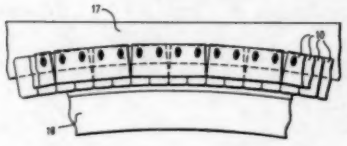
1. A game device having particular utility for being played by two or more persons, comprising:
a pair of support poles;
a rod rotatably mounted between said pair of support poles;
at least one paddle board affixed to an intermediate portion of said rod;
a string collection means affixed to and coincidentally rotated with said rod;
a line secured at a top end to said string collection means and having a bottom end for hanging downwardly from said string collection means;
a score weight affixed to said bottom end of said line; and
a toss ball dimensioned for being hand held and tossed at said paddle board.

4,961,588
RADIAL SEAL
Anthony R. Brienza, Orange, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jan. 31, 1989, Ser. No. 304,974
Int. Cl.[5] F16J *15/32;* **F27B** *7/24*
U.S. Cl. 277—148 **10 Claims**

1. A radial seal in combination with a rotatable cylinder

having a sealing surface and a stationary windbox of a rotary kiln, the radial seal comprising:

a plurality of seal sections, each seal section having two opposed ends, said seal sections being disposed, with an end of one seal section adjacent an end of another seal section, about the sealing surface of the rotatable cylinder,



each seal section further having a plurality of resilient finger-like members; and

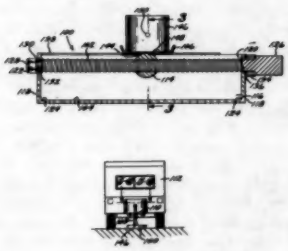
securing means for securing said seal sections to the windbox with said plurality of finger-like members being arranged to abut and press against the sealing surface of the rotatable cylinder.

4,961,589

TRAILER TONGUE ALIGNMENT

Erv Faurenhoff, Los Angeles, Calif., assignor to Norco Industries, Inc., Compton, Calif.

Filed Mar. 9, 1989, Ser. No. 321,003
Int. Cl.[5] B60D 1/00
U.S. Cl. 280—475 **9 Claims**



1. A trailer tongue alignment apparatus for aligning a trailer tongue with a tow vehicle ball hitch comprising, in combination:

a housing;

a threaded screw mounted within said housing for rotating about a fixed axis;

a receiver ring for supporting a tongue jack of a trailer, said receiver ring affixed to a load-bearing sled mounted on said housing;

a block trunnion affixed to said load-bearing sled for movably connecting said sled to said threaded screw; and

a nut in communication with said threaded screw for rotating said screw about said fixed axis, said rotated screw incrementally driving said sled along said fixed axis for adjusting the position of said tongue jack and for aligning said trailer tongue with said tow vehicle ball hitch.

4,961,590

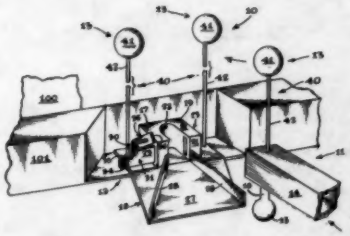
TRAILER HITCHING APPARATUS

Duke Davenport, 703 N. Birch, Owasso, Okla. 74055

Filed Jul. 14, 1989, Ser. No. 310,266
Int. Cl.[5] B60D 1/06
U.S. Cl. 280—477 **10 Claims**

1. A trailer aligning and hitching apparatus for towing vehicles and trailers having a tongue wherein the hitching apparatus comprises:

a base unit operatively secured to the rear of the towing vehicle wherein the base unit comprises a base housing member including a generally rectangular housing element having a top a face and opposed sides; and, the housing element is further provided with an enlarged housing cavity which extends through the face and the opt of the housing element wherein the width of the cavity opening in the face of the housing element is substantially greater than the width of the cavity opening in the top of the housing element; wherein, the base housing member further comprises a pair of aligned elongated apertures formed through the sides of the housing element proximate the front of the enlarged housing cavity; and, wherein the base unit also includes a first locking member comprising a slidable lock bar member which is dimensioned to be received in said aligned apertures in the



housing element and a second locking member comprising a pivoted retaining bar member which is pivotally secured about a lateral axis to one side of the housing element and adapted to operatively and releasably engage said first locking member;

a ball equipped hitch unit operatively secured to said trailer tongue wherein the hitch unit comprises a ball element operatively secured to said trailer tongue via a shaft element; wherein, said ball element is dimensioned to be received into the housing cavity of said base unit through the cavity opening in the face of said housing element; and, the shaft element is dimensioned to be received in the cavity opening in the base unit through the cavity opening in both the face and the top of said housing element; and,

a visual reference unit comprising a plurality of visual indicator members operatively associated with both base unit and the base equipped hitch unit for aligning the towing vehicle with respect to the trailer tongue.

4,961,591

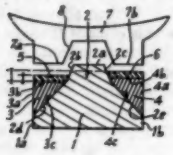
LATERAL GUIDANCE APPARATUS FOR A CROSS-COUNTRY SKI BOOT

Alain Bejean, La Clusaz, and Gerard Graillat, Annecy, both of France, assignors to Salomon, S.A., Annecy Cedex, France

Filed Dec. 23, 1988, Ser. No. 288,944
Claims priority, application France, Dec. 24, 1987, 87 18141
Int. Cl.[5] A63C 5/06
U.S. Cl. 280—607 **31 Claims**

1. Lateral guidance apparatus for a boot on a cross-country ski comprising, at an upper portion of said ski, a longitudinal rib having an internal side and an external side, said rib constituting a lateral guidance element for a boot having, in its sole, a longitudinal groove which caps the rib in the course of flattening said boot on the ski, said sole further having a lower support zone on either side of said groove, said lateral guidance apparatus further comprising two elastic elements positioned, respectively, on said internal side and on said external side of said longitudinal rib, each said elastic element having an upper surface, wherein said upper surfaces of said elastic external element and said elastic internal element and said lower

support zones of said sole positioned on either side of said groove in said sole are positioned, with respect to one another, in a manner such that in the position of said sole substantially



flattened on said ski, and when said two elastic elements are compressed, said sole is inclined transversely from top to bottom and from the external side of the ski towards the internal side of the ski, respectively.

4,961,592

SKI HAVING A VARIABLE WIDTH UPPER SURFACE

Jean-Luc Diard, and Francois Guers, both of Annecy, France, assignors to Salomon S.A., Annecy Cedex, France

Filed Jul. 13, 1988, Ser. No. 218,145

Claims priority, application France, Jul. 15, 1987, 87 10331

Int. Cl.[5] A63C *5/04*

U.S. Cl. 280—609 **46 Claims**

1. A ski for use on snow comprising:

(a) a longitudinally extending body having a central region interposed between an anterior segment at the front of the ski and a posterior segment at the rear of the ski terminating in a free rear end;

(b) said body having a low sliding surface connected to two lateral side surfaces defining a pair of opposed lower edges;

(c) the two lateral side surfaces of the body being inclined relative to the lower surface, and being connected to an upper surface; and

(d) said upper surface having a width defined by two upper edges which diverge towards the front of the ski in both said posterior and anterior segments of the body;

(e) the inclination angle of the side surfaces, measured between the lower sliding surface and a side surface, varying in a progressive and continuous manner in the longitudinal direction.

4,961,593

GOLF TROLLEY

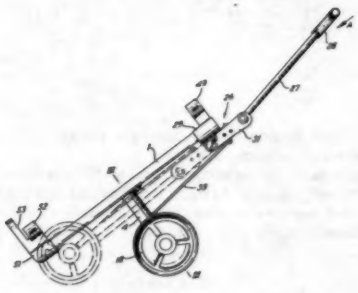
Mark A. Sanders, Windsor, and Derek D. Roberts, Holyport, both of England, assignors to Acushnet Limited, United Kingdom

Filed Nov. 15, 1988, Ser. No. 271,899

Claims priority, application United Kingdom, Nov. 18, 1987, 87/26958

Int. Cl.[5] B62B *1/04*

U.S. Cl. 280—646 **15 Claims**



1. In a collapsible golf trolley having an elongate chassis member forming the principal structural element of the trolley, a pair of wheel struts pivotally connected at one end to the chassis member intermediate the ends thereof and normally lying at an angle to each other on opposite sides of the median plane of the trolley, said wheel struts each carrying at their distal ends on opposite sides of the trolley a ground engaging wheel, upwardly extending bracket means at each end of the chassis member for receiving and retaining thereon a golf bag containing a plurality of golf clubs, an elongate handle pivotally connected to said chassis member at one end and pivotable between a first, extended position in which the handle extends from the chassis member in a direction generally coaxial therewith and a second, collapsed position in which the handle substantially lies alongside the chassis member, and rigid link means connected directly between said handle and said wheel struts, whereby, when the handle is in its first, extended position the wheel struts are splayed outwardly on opposite sides of the trolley, and, when the handle is in its second, collapsed position, the wheel struts pivot inwardly towards the chassis member so as to lie, in the collapsed condition of the trolley, substantially alongside the chassis member with the wheels closely adjacent thereto on opposite sides, the improvements comprising:

(a) the chassis member comprising an elongated, inverted channel-shaped, lightweight alloy extrusion having a cross-section that is uniform along the length of the extrusion, said cross-section providing on the underside of the chassis member a pair of downwardly divergent sidewalls defining the opposite sides of the inverted channel, said downwardly divergent sidewalls being symmetrically disposed on opposite sides of the median plane of the channel at a predetermined angle corresponding to the angle of divergence of said wheel struts to said median plane when said struts are in their splayed out position on either side of the trolley, said downwardly divergent sidewalls providing downwardly divergent abutment surfaces against which the wheel struts are pivoted at their proximal ends and determining the angle of divergence of the wheel struts when in their splayed out position on opposite sides of the trolley; and

(b) the wheel struts pivotally mounted at their proximal ends against said downwardly divergent abutment surfaces provided by said downwardly divergent sidewalls, each of said wheel struts comprising two parallel lightweight alloy extrusions having substantially identical uniform

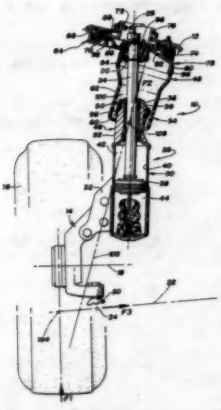
channel-shaped cross-sections extending the length of each extrusion, the free edges of the opposite sidewalls defining each channel of each pair of extrusions forming each of the two wheel struts slidably mating one within the other, each of said two parallel extrusions forming each of the two wheel struts being pivotally connected at their proximal ends to the elongate chassis member in pivotal abutting relation to a respective one of the two downwardly divergent abutment surfaces provided on the underside of the chassis member and, at their distal ends, each to a respective wheel bracket mounting a respective one of the two ground wheels, each of said two parallel extrusions forming each of the two wheel struts thus forming, together with the chassis member at one end and the wheel brackets at the other, a parallel linkage constrained to move between the splayed and collapsed positions of each wheel strut, each in an oppositely inclined plane defined by the angles of the downwardly divergent sidewalls on the underside of said chassis member.

4,961,594

END RETAINER FOR AIR SPRING IN STRUT SUSPENSION

James M. Pees, Centerville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 24, 1989, Ser. No. 342,147
Int. Cl.[5] B60G *15/14*
U.S. Cl. 280—693 **2 Claims**



1. In an automotive strut suspension system including

a strut having a damper tube connected to an unsprung mass and constrained for generally vertical movement relative to a sprung mass and a rod slidable relative to said damper tube along a longitudinal axis of said strut and a piston on said rod slidable along said longitudinal axis within said damper tube,

a cord reinforced cylindrical flexible air spring sleeve having a circular first end and a circular second end, and

an air spring piston on said damper tube sealingly connected to said air spring sleeve at said first end such that a rolling lobe of said air spring is defined around said air spring piston and the geometric center of said rolling lobe defines a first point through which the resultant force of said air spring on said damper tube is directed,

an air spring top end retainer comprising:

means defining an elliptic clamping flange having a perimeter length substantially equal to the circumference of said circular second end of said air spring sleeve so that said circular second end fits closely over said elliptic flange without stretching,

means defining a center web connected to an edge of said elliptic clamping flange and including a bushing aperture tangent to said elliptic flange at a major dimension end thereof,

means connecting said center web to said sprung mass with said rod of said strut projecting into said bushing aperture,

resilient bushing means between said rod of said strut and said center web, and

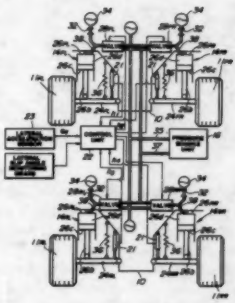
means operative to sealingly clamp said circular second end of said air spring sleeve to said elliptic flange so that the geometric center of said elliptic flange defines a second point through which the resultant force of said air spring is directed.

4,961,595

ACTIVE SUSPENSION SYSTEM FOR AN AUTOMOTIVE VEHICLE WITH SLIP ANGLE DEPENDENT CONTROL FOR ENHANCED STEERING CHARACTERISTICS

Naoto Fukushima; Yukio Fukunaga; Yohsuke Akatsu; Itaru Fujimura, and Masaharu Satoh, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 18, 1989, Ser. No. 422,813
Claims priority, application Japan, Oct. 18, 1988, 63-262249; Oct. 18, 1988, 63-262250
Int. Cl.[5] B62D *9/02*
U.S. Cl. 280—772 **23 Claims**



1. An anti-rolling control system for an automotive suspension system comprising:

a front suspension system disposed between a vehicular body and a suspension member rotatably supporting a front wheel, said front suspension system defining a working chamber filled with a working fluid and variable of the fluid pressure within said working chamber for adjusting suspension characteristics;

a rear suspension system disposed between a vehicular body and a suspension member rotatably supporting a rear wheel, said suspension system defining a working chamber filled with a working fluid and variable of the fluid pressure within said working chamber for adjusting suspension characteristics;

first pressure control valve means associated with said working chamber of said front suspension system for controlling introduction and draining of working fluid into and from said working chamber for adjusting the fluid pressure therein;

second pressure control valve means associated with said working chamber of said rear suspension system for controlling introduction and draining of working fluid into and from said working chamber for adjusting the fluid pressure therein;

means for monitoring vehicular rolling magnitude for producing a rolling magnitude indicative signal;

means for monitoring a vehicular driving parameter representative of demand for vehicular stability factor for pro-

ducing a stability factor demand indicative signal representative thereof;

means for deriving first and second control signals on the basis of said rolling magnitude indicative signal and first and second coefficient values order to control said first and second pressure control valve means for inducing counter rolling at a controlled magnitude, said control signal deriving means varying said first and second coefficient values depending upon said stability factor demand indicative signal value so as to vary vehicular steering characteristics.

4,961,596

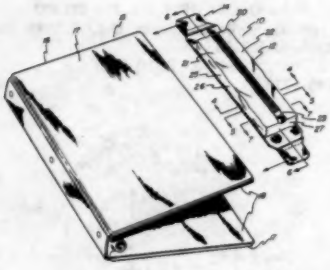
BINDER POUCH

Marc L. Moor, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed May 15, 1989, Ser. No. 351,366

Int. Cl.[5] B42D *3/00*

U.S. Cl. 281—15.1 **3 Claims**



1. On a binder comprising interconnected front and rear covers each having an outwardly facing side and an inwardly facing side and each having a pair of opposed parallel ends, a binder pouch encirclenly attached to one of said covers for storing writing accessories, said binder pouch comprising an elastic strap stretched around said ends of said one cover and extending therebetween along the inwardly facing side of said cover, and a deformable storage unit secured to said strap adjacent the outwardly facing side of said cover; said storage unit being provided with an access opening for entry of the writing accessories and closure means for selectively opening and closing said access opening means.

4,961,597

SEALING RING

Norman D. Bowen, 5 Queensborough Crescent, Weston, Ontario M9R 1A1, Canada

Filed Jul. 5, 1989, Ser. No. 375,634

Int. Cl.[5] F16L *35/00*

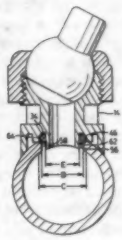
U.S. Cl. 285—24 **9 Claims**

1. A sealing ring for use in sealing a substantially cylindrical section spigot and the like of a first diameter extending from a body of greater diameter than the spigot in a hole of a second diameter, means being provided to retain the spigot in the hole, the sealing ring being formed of resilient material and comprising:

a proximal portion having an external third diameter greater than said second diameter, an internal fourth diameter and a proximal face, the proximal portion being adapted for location surrounding the spigot with the proximal face abutting the body from which the spigot extends;

a distal portion having an external fifth diameter, an internal sixth diameter lesser than said first diameter when the sealing ring is undeformed, and a thickness lesser than the spacing between the spigot and the hole when the sealing ring is located on the spigot, the distal portion being adapted to engage the spigot and retain the sealing ring thereon; and

an intermediate seating portion between the proximal and distal portions and tapering inwardly, at least on an exter-



nal surface, from the distal portion to the proximal portion,

wherein the intermediate seating portion is adapted to seat on the edge of the hole and to form a line contact, at least on initial contact therewith.

4,961,598

WELDED PIPE JOINT

Göran Sundholm, Magistervägen 34 B, Grankulla, Finland (SF-02700)

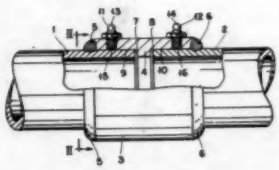
PCT No. PCT/FI88/00012, § 371 Date May 23, 1989, § 102(e) Date May 23, 1989, PCT Pub. No. WO88/05881, PCT Pub. Date Aug. 11, 1988

PCT Filed Jan. 28, 1988, Ser. No. 368,314

Claims priority, application Finland, Jan. 30, 1987, 870423

Int. Cl.[5] F16L *00/07*

U.S. Cl. 285—94 **5 Claims**



1. A socket weld fitting to join at least two pipes together, comprising a socket, having an internal annular shoulder extending inwards from an internal surface of said socket, for receiving end portions of said pipes so that a gap is formed, between said annular shoulder and an end surface of said end portions, and a narrow radial clearance is formed between said internal surface and an external surface of said end portions, and wherein said end portions are welded to end parts of said socket and at least two bores are provided through said socket for introducing a lubricant to said gap and said clearance, and that a peripheral annular groove, adjacent to each said bore, is formed to distribute said lubricant.

4,961,599

SEALING GLAND CONSTRUCTION FOR USE IN HYDRAULIC UNIT JOINTS

Oliver S. Delery, Jr., P.O. Box 50520, New Orleans, La. 70150, and William T. Burt, 622 S. Lake View, Baton Rouge, La. 70810

Filed Aug. 9, 1988, Ser. No. 229,969

Int. Cl.[5] F16L *21/02*

U.S. Cl. 285—230 **11 Claims**

7. In a sealing gland construction for use in connection with

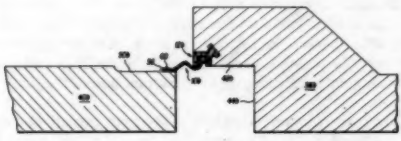
hydraulic unit joints formed between two concrete pipe members one of which is formed with a male end member and the other of which is formed with a cooperating female end member, the improvement which comprises:

a. a receptacle formed from elastomeric material and having a portion adapted to receive a sealing gland member which is also formed from elastomeric material.

i. said receptacle being received within an inner wall portion of said cooperating female end member and extending perimetrally around within said female end member,

ii. said receptacle including means externally of its gland receiving portion including at least one protruding portion to lock said receptacle to said female end member.

b. said sealing gland member having an enlarged and compressible head at one end thereof which is received and compressed within said receptacle and which extends for the perimetral length thereof,



c. said portion of said receptacle for receiving said enlarged head of said sealing gland being sized with respect to said enlarged head to maintain said enlarged head in compression both vertically and horizontally prior to the assembly of said male and female members and irrespective of tolerances between said male and female members,

d. said male end member having the other end of said sealing gland secured adjacent said male end with the point at which it is secured being inserted into said female end past said receptacle to effect a joint wherein said sealing gland is encased between the walls of said pipes and wherein a fluid seal is established between said cooperating male and female ends of said pipes which remains sealed even in the event of a slight discoupling of said joint.

4,961,600

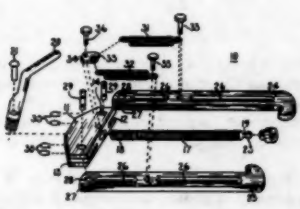
TANK COVER CLAMP

Dale E. Points, P.O. Box 662, Lakefork, Id. 83635, and Timothy L. Everhart, Rte. 1, Box 21, McCall, Id. 83638

Continuation of Ser. No. 325,238, Mar. 20, 1989, abandoned. This application Apr. 16, 1990, Ser. No. 509,557

Int. Cl.[5] E05B 65/00; E05C 9/00

U.S. Cl. 292—25 **6 Claims**



1. A safety sealing device for sealing the opening covers on the tank of vehicular tankers and the like, which comprises:

a yoke member having a first end and a second end and a transverse throughhole centrally located therebetween;

first and second elongated claw members, wherein said first claw member is pivotally attached to the first end of said yoke member and said second claw member is pivotally attached to the second end of said yoke member;

said elongated claw members being configured for engagement with a purchase handle without contacting said cover;

spring biasing means being centrally attached to said yoke member and to said first and second claw members, thereby urging said claw members toward a central point between said claw members and providing an equal displacement of said claw members therefrom during installation; and

a traveler member including axial displacement means, being in cooperative engagement with the throughhole in said yoke member and further having first and second ends wherein the traveler member is disposed such that its first end lies between said first and second claw members, for axial displacement therebetween.

4,961,601

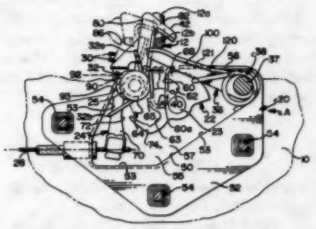
VEHICLE CLOSURE LATCH AND POP-UP DEVICE

Kari A. Lindholm, Livonia, and James Bolsworth, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 29, 1988, Ser. No. 237,024

Int. Cl.[5] E05C 3/26

U.S. Cl. 292—216 **6 Claims**



1. In an automotive vehicle having body structure defining a vehicle compartment, a closure having a striker on its underside and which is supported by said body structure for movement between a closed position in which it covers said compartment and an open position in which it permits access to said compartment, and a preassembled closure latch and pop-up device which is mounted as a unit to the vehicle body structure and which cooperably engages the striker on said closure to releasably hold the latter in a closed position,

said closure latch and pop up device comprising a housing which is mounted to the vehicle support structure,

a primary latch pivotally supported by the housing via a first pivot means for movement between a latched position in which it is hookable over the striker pin to latch the closure in a closed position and an unlatched position in which it unlatches the striker to allow movement of the closure to an open position, said primary latch being biased towards its unlatched position,

a detent lever pivotally supported by said housing via a second pivot means for movement between a detented position in which it cooperably engages said primary latch to hold the same in its latched position and a second position in which it is disengaged from said primary latch to allow said primary latch to move toward its unlatched position,

release means connected with said detent lever for effecting movement of the detent lever from its detented to its second position,

a secondary latch pivotally supported by said second pivot means for movement between a latched position in which an end thereof is located above the primary latch and in the path of movement of the striker to limit the extent of

upward movement of the striker after the detent lever releases the primary latch for movement to its unlatched position to unlatch the striker, and an unlatched position in which said end of said secondary latch is disposed out of the path of movement of the striker to enable the closure to be moved toward its fully open position,

a single first spring means operatively connected with both the detent lever and said secondary latch for simultaneously biasing the detent lever toward its detented position and said secondary latch toward its latched position,

a pop-up lever pivotally supported by said housing by a third pivot means,

a second spring means operatively connected with said pop up lever and said housing for biasing said pop up lever to an upper position in which it is disposed within the path of movement of said striker, said pop up lever being movable from its upper position and in opposition to the biasing force of said second spring means to a depressed position and held therein by the striker when the closure is in its closed position,

said second spring means effecting upward movement of said pop up lever to move said striker and closure to a pop up position in which the striker engages said secondary latch when the primary latch is moved to its unlatched position by said release means,

said secondary latch being manually manipulable to enable the secondary latch to be moved to its unlatched position when the striker and closure are in their pop up position,

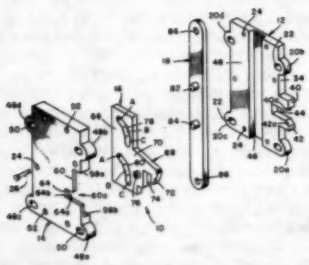
said primary and secondary latches having striker surfaces thereon which are engageable by the striker to allow the secondary latch to be momentarily cammed to its unlatched position and the primary latch to be cammed to its latched position when the closure is moved toward its closed position.

4,961,602

LATCH MECHANISM

Sven A. Pettersson, Santa Monica, Calif., assignor to Adams Bite Products, Inc., Glendale, Calif.

Filed Mar. 16, 1987, Ser. No. 25,996
Int. Cl.[5] E05C *19/10*
U.S. Cl. 292—98 **6 Claims**



1. A latching mechanism for holding a striker element or the like in a locked position, including

a body member formed by first and second plate type members, the first plate type member having an elongated, linear channel therein and the second plate type member having a recess therein with an open side coextensive with an edge of said second plate type member, said first and second members being joined together so that the channel in said first plate member faces the recess of the second plate type member, and each of said first and second members having notches therein which form a groove in the body member for receiving a striker element upon the first and second members being joined together, with said groove having an open mouth proximate said edge,

a movable hook member received within said recess and having a hook element extending outwardly from said plate type members through said open side of the recess, a first follower element which is adapted to ride along said edge of said second plate type member as the hook member moves, and a cam section on said hook member for controlling the movements of the hook member so that upon actuation, said hook members moves

(a) rectilinearly along a first path from an open position with the hook element adjacent the groove but offset therefrom to allow the striker element to be received within the mouth of the groove to an intermediate position with the hook element covering the mouth of the groove and grasping the striker element, and

(b) rectilinearly along a second path at a right angle with respect to the first path, with the hook member pulling the striker element inwardly into the groove to the locked position, and

an actuator coupled to the hook member and seated in said channel in said first plate type member, and slidably movable therein, to move said hook member between said open and locked position, and including a second follower element which engages the cam section of the hook member,

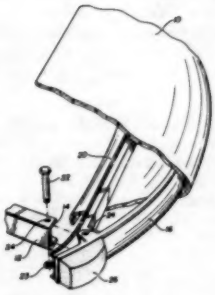
said cam section including a segment which allows said second follower element to move a predetermined distance laterally to enable the actuator element to move rectilinearly within the channel after the hook member is in the locked position without disengaging the grasp of the hook element from the striker element to maintain the hook member in the locked position.

4,961,603

VEHICLE BUMPER SYSTEM

Ronald A. Carpenter, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 19, 1989, Ser. No. 452,490
Int. Cl.[5] B60R *19/04*
U.S. Cl. 293—102 **17 Claims**



1. A vehicle bumper system for protecting a vehicle, said vehicle including a pair of longitudinally extending load bearing members, comprising:

a curved bumper member extending between the ends of said pair of longitudinally extending load bearing members,

tension means extending between said ends of said pair of longitudinally extending load bearing members for opposing outwardly directed lateral forces which may be applied to said load bearing members, and

means for pivotally connecting said curved bumper member and said tension means to said ends of said pair of longitudinally extending load bearing members at the same locations on said load bearing members, such that an impact force applied to said bumper member does not result in outwardly directed lateral forces being applied to said

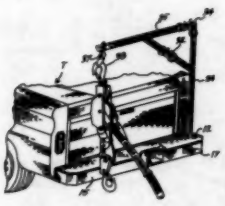
load bearing members, or such lateral forces are minimized.

4,961,604

COMBINATION STEP BUMPER AND HOIST APPARATUS

Richard L. Kisner, 11255 SW. Greenburg Rd., Apt. #15, Tigard, Oreg. 97223

Filed Jul. 18, 1989, Ser. No. 381,464
Int. Cl.[5] B60R *19/48*
U.S. Cl. 293—106 **3 Claims**



1. A combination step bumper and hoist apparatus for securement to an automotive vehicle, comprising,

a storage container including a floor, a forward wall, and a rear wall spaced from said forward wall wherein said storage container is adapted for securement to said vehicle, and

spaced side walls,

a lid overlying said floor and of a complementary configuration to said floor including a rear edge spaced from a forward edge, said rear edge hingedly mounted to said rear wall, and

a hoist assembly, and

clip means projecting from the floor of the storage container for resilient securement of the hoist assembly, and

wherein the hoist assembly includes a first post, a second post, a third post, and fourth post, the posts disassembled in a first orientation for securement within the clip means, and the posts assembled in a second orientation to define an erected hoist assembly, and

including an "L" shaped elbow mounted to an upper terminal end of the first post, the elbow receiving a first end of the second post therewithin, and the first post including a first stub shaft oriented at an acute angle to the first post, and the second post including a second stub shaft oriented at an acute angle to the second post, and the first stub shaft arranged for reception within the third post, and the second stub shaft arranged for reception within the fourth post, the third and fourth posts aligned relative to one another when the third and fourth posts are respectively secured to the first and second stub shafts, and a sleeve including lock pins for receiving and aligning the third and fourth posts at remote ends from the first and second stub shafts, and

wherein the elbow includes a plurality of lock pins for locking the first and second posts therewithin, and

wherein the clip means includes a first spring latch pair aligned relative to one another and the first spring latch pair spaced a distance substantially equal to the combined widths of the first and second posts, and

wherein the first post, the second post, the third post, and the fourth post are each of a length less than that defined by the floor of the storage container, and

wherein the clip means further includes a second spring latch pair and a third spring latch pair for respectively receiving the third post and fourth post resiliently therewithin, and

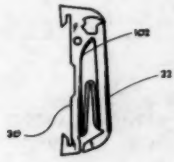
including a support cylinder integrally and orthogonally secured to the floor of the storage container and positioned adjacent an intersection defined by the rear wall and a side wall of the storage container, and further including a through-extending aperture formed through the lid wherein the aperture is coaxially aligned with the support cylinder when the lid is arranged parallel and overlying the floor of the storage container.

4,961,605

EXTENDABLE PROTECTIVE TRIM

Derrick Cawthron, Ft. Worth; Robert L. Woods, Arlington; James B. Story, Denton; Carl S. Lammons, Arlington, and Donald W. Murray, Ft. Worth, all of Tex., assignors to Body Guard, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 55,328, May 29, 1987, abandoned. This application Sep. 19, 1988, Ser. No. 245,912
Int. Cl.[5] B02R *19/20, 19/42*
U.S. Cl. 293—128 **17 Claims**



1. A protective trim system for protecting a surface of an engine driven vehicle from impact damage when said vehicle is stationary, comprising:

a mounting flange mounted on said surface to be protected;

an elongated trim member pivotable between extended and retracted positions, said trim member protecting said surface from impact damage in said extended position, said trim member moving toward said extended position when said engine is de-activated; and

means for providing a vacuum between said trim member and said mounting flange when said vehicle engine is activated, said vacuum means drawing said trim member from said extended position to said retracted position.

4,961,606

DEVICE FOR ADAPTION OF A SUCTION PAD TO THE OUTER SHAPE OF PRODUCTS TO BE LIFTED

Hans E. G. Nilsson, Skravelsjö 21096, Umeå, Sweden S-905 90

Filed Sep. 22, 1988, Ser. No. 249,779
Claims priority, application Sweden, Oct. 6, 1987, 8703844
Int. Cl.[5] B25J *15/06*; B66F *9/18*
U.S. Cl. 294—65 **11 Claims**

1. A device for adaptively grasping a product, comprising:

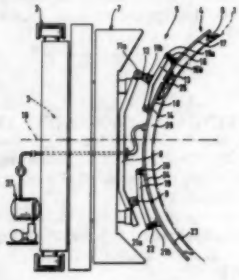
carrying means having first and second ends;

first and second bracket means respectively pivotally connected to said first and second ends of said carrying means, said carrying means arranged to adaptively position said first and second bracket means in a product grasping relationship;

first and second support means for supporting said product, said first and second support means pivotally connected to said first and second bracket means, respectively; and

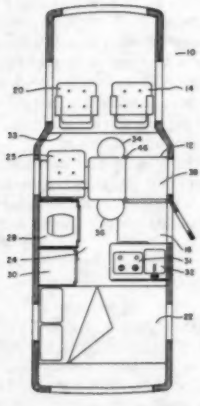
suction pad means provided on said first and second support means for directly contacting said product when said first and second bracket means are in said product grasping relationship, wherein said first bracket means is pivotally

connected to the first end of said carrying means via a double link, and said second bracket means is pivotally



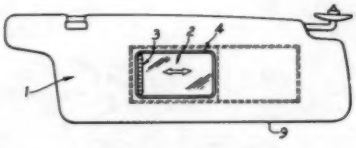
connected to the second end of said carrying means via a single link.

4,961,607
VEHICLE CABINET
William M. Marshall, Sr., 1050 Givens-Tyler Rd., Salem, Va. 24153
Filed Jun. 19, 1989, Ser. No. 367,864
Int. Cl.[5] B60P *3/03*
U.S. Cl. 296—156 15 Claims



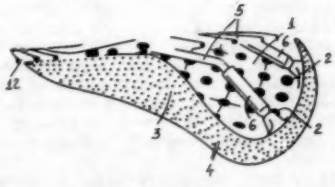
1. A cabinet comprising a pair of front vertical corner posts, a pair of rear vertical corner posts, each of the front and rear posts having upper and lower sections, and each of the front posts also having an intermediate section between and rotatable relative to its upper and lower sections, means extending through each intermediate section and into the upper and lower sections of the same post to connect the sections and support the intermediate section for said rotation, a pair of seats, and means extending from each intermediate section to connect with and support one of said seats, each of said seats and its supporting means being rotatable with the intermediate section from which the supporting mean extends, between a retracted position in which the seat is inside the cabinet and an extended position outside the cabinet where the seat can be used for seating next to the cabinet.

4,961,608
SUN VISOR INCORPORATING A SLIDABLE MIRROR
Douglas H. Nash, Alvechurch, England, assignor to Austin Rover Group Limited, United Kingdom
Filed Apr. 26, 1989, Ser. No. 343,518
Claims priority, application United Kingdom, Apr. 30, 1988, 8810350
Int. Cl.[5] B60J *3/00*; B60R *1/12*
U.S. Cl. 296—97.5 13 Claims



1. A sun visor comprising:
a moulded frame,
trim material covering the moulded frame and defining a first aperture in a surface of the visor, a cassette assembly attached to the moulded frame, and a mirror slidingly supported within the cassette assembly, the cassette assembly having a cover member and a base member, the cover member defining a second aperture aligned with said first aperture and having a number of latching members formed integrally therewith for engagement with respective third apertures defined by the base member to enable the base member and the cover member to be snap-fitted together, wherein the mirror is slidable from a first position in which it is viewable through said first and second apertures in the trim material and in the cover member, respectively, to a second stowed position where it lies behind the cover member and the trim material and is thus hidden from view.

4,961,609
COMFORTABLE USE BICYCLE SADDLE
Giuseppe Bigolin, Via Fermi, 2/A—31010, Casella d'Asolo (Treviso), Italy
Filed Jul. 21, 1989, Ser. No. 383,931
Claims priority, application Italy, Jul. 27, 1988, 21671/88[U]
Int. Cl.[5] B62J *1/00*
U.S. Cl. 297—214 1 Claim



1. A bicycle saddle of the type comprising a saddle body including a plurality of throughgoing holes, a perforated coating cover on said saddle body and an air permeable padding within said saddle body wherein said saddle further comprises a saddle frame comprising two frame side rod members extending longitudinally of and connected at the ends of said saddle body and each including a respective end damper element, each said end damper element having a respective tubular body including therein an abutment which thereagainst a coil spring abuts, said spring encompassing end portions of said rod members forming one end of said saddle frame and are provided with a respective circumferential enlarged portion engaging one end of said coil spring, each said damper element

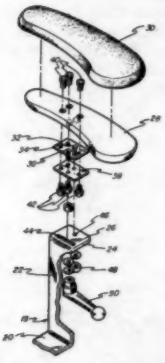
having one end thereof engaged with a lug associated with said saddle body.

4,961,610

CLAM SHELL ARMREST

Ryan A. Reeder, Piqua; David C. Bester, Troy, and John H. Oldiges, Minster, all of Ohio, assignors to Midmark Corporation, Versailles, Ohio

Filed Aug. 21, 1989, Ser. No. 396,498
Int. Cl.[5] A47C 7/54
U.S. Cl. 297—412 9 Claims



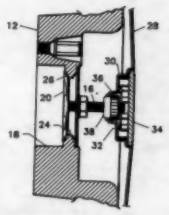
9. A chair having a support pedestal for supporting a seat, a vertically adjustable backrest attached to a back portion of said seat, and a pair of pivotable armrest assemblies attached to opposing sides of said seat and forming a substantially U-shaped structure, each armrest assembly comprising a support bar having a lower horizontal portion immovably connected to said seat and a vertical extension extending vertically upward from said seat, said support bar having an upper horizontal planar extension including a pivot hole distal from said vertical extension and a substantially straight guide slot proximate said vertical extension and extending from a front to a rear portion of said planar extension, an elongated armrest including a broad front portion and a narrow rearward portion, said armrest comprising a substantially planar board and a padded portion overlying one side of said board, means defining three through holes in said board, T-nuts positioned in said through holes, a mounting plate having defined therethrough two holes, pivot and locking bolts extending through said mounting plate holes, said bolts having heads welded to said mounting plate, said mounting plate being attached substantially intermediate the ends of said armrest board by means of a pivot plate and three plate attaching bolts passing through both said mounting plate and said pivot plate and engaging said T-nuts, said pivot plate having two holes through which said pivot bolt and locking bolt pass, said pivot bolt extending through said pivot hole forming a pivot point for said armrest and said locking bolt extending through said guide slot said locking bolt including means to allow said locking bolt to move along said guide slot in a slightly curved guide path, said pivot point including a nut on an end of said pivot bolt, an elongated lever having a threaded aperture at one end threadably receiving said locking bolt such that rotation of said lever in a first direction will allow said armrest to pivot in a horizontal plane about said pivot bolt, and rotation of said lever in a second direction will cause a bottom portion of said armrest to frictionally engage said planar extension and lock said armrest in position, said pivot and guide slot cooperating to permit movement of said front portion of said armrest inward from the sides of said chair to overlie said seat, such that operators sitting in said chair may rest their forearms on said armrests with their arms angled inward.

4,961,611

VEHICLE WHEEL COVER

Anthony J. Patti, 27610 Fairview Avenue, Hayward, Calif. 94542

Filed Feb. 6, 1989, Ser. No. 306,057
Int. Cl.[5] B60B 7/04
U.S. Cl. 301—37 SC 3 Claims



1. A wheel cover mounting for a vehicle wheel having lug mounting means and a central hub opening, said wheel cover mounting comprising:

a threaded shaft extending axially outward from the center of the wheel hub opening, one end of said shaft secured to an elongated inner plate having a length larger than the diameter of the central hub opening and a width narrower than said diameter, said inner plate being positioned against the inner surface of said wheel;

an outer plate having a centrally located shaft clearance opening and positioned against the exterior surface of said wheel;

means for clamping together said inner and outer plates against said wheel;

a threaded locking nut for engaging said threaded shaft, said locking nut having a smooth, cylindrical, exterior, first surface of a first diameter adjacent an end facing said wheel and a cylindrical second surface of a second diameter between said first surface and an end distal of said wheel, said second diameter being larger than said first diameter;

a nut retaining cup having first and second ends, the first end having a central axial hole, the diameter of said hole permitting passage and rotation of the first diameter of said threaded locking nut and preventing passage therethrough of said second diameter of said nut, the second end of said retaining cup having a cylindrical inner surface closely adjacent the cylindrical second surface of said threaded locking nut and an outwardly extending flange; and

a wheel cover having a central hole having a diameter corresponding to the diameter of the exterior of the second end of said nut retaining cup and less than the diameter of the outwardly extending flange on said retaining cup.

4,961,612

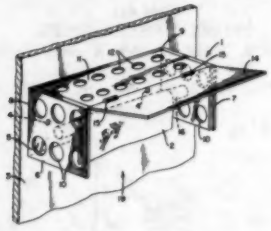
DISHCLOTH HANGER CABINET

Barbara D. Howard, 519 Millwheel St., Capitol Heights, Md. 20743

Filed Apr. 7, 1987, Ser. No. 35,480
Int. Cl.[5] B65H 19/00
U.S. Cl. 312—37 22 Claims

1. A cabinet for air drying damp fabric comprising a back wall and means for attaching said back wall to a vertical support surface; a pair of perforated side walls facing each other and being attached to and extending away from said back wall; a perforated top connecting said back and side walls; a movable front door spanning the space between said side walls; rod

means having its ends connected to said side walls and disposed within said cabinet for removably supporting said fabric



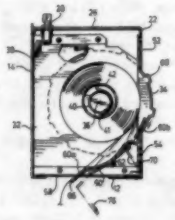
draped over said rod means such that said fabric is entirely disposed within said cabinet and out of view; and the bottom of said cabinet being open.

4,961,613

DISPENSING CABINET FOR STRIP MATERIAL

R. Warren Biggar, Burlington, Canada, assignor to Frost Products Limited, Hamilton, Canada

Filed Oct. 18, 1989, Ser. No. 423,300
Int. Cl.[5] B65H *19/00*
U.S. Cl. 312—38 **8 Claims**



1. A dispensing cabinet for strip material comprising:

a cabinet frame including a face cover plate having a vertical slot therein, the cabinet frame also providing a horizontal exit slot through which the strip material is dispensed form the cabinet interior;

a handwheel mounted by the cabinet frame for rotation about a horizontal axis and so as to protrude out of the cabinet through the vertical slot for engagement and rotation by the hand of a user;

the handwheel providing a plurality of circumferentially-spaced radically-extending ratchet teeth movable in a corresponding circular path about the horizontal axis for selective engagement by a ratchet member;

a boss member rotatable with the handwheel and engagable with a core of a roll of strip material so that rotation of the handwheel rotates the roll engaged by the boss; and

a strip tearing member mounted by the cabinet frame adjacent the horizontal exit slot for pivoting movement about a horizontal axis, a horizontal edge of the member adjacent the slot constituting a tearing edge for the strip when it is pulled by a user into sufficiently strong contact therewith;

the strip tearing member carrying a ratchet member movable into the path of said ratchet teeth to engage the next succeeding ratchet tooth and prevent further rotation and dispensing of the strip material;

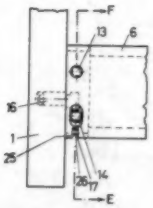
the strip tearing member being biased for movement about its pivot to normally hold the ratchet member out of the path of the ratchet teeth and permit dispensing of the strip, and being moved against the bias to move the ratchet member into said selective engagement with a ratchet tooth of the handwheel by the pulling of the strip against the tearing edge while the strip is thus retained against further dispensing.

4,961,614

DRAWER INCLUDING IMPROVED LATERAL AND VERTICAL ADJUSTMENT ASSEMBLY

Erich Röck, Höchst, Austria, assignor to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Dec. 4, 1989, Ser. No. 445,773
Claims priority, application Austria, Dec. 5, 1988, 2973/88
Int. Cl.[5] A47B *88/00*
U.S. Cl. 312—341.1 **12 Claims**



1. In a drawer including a bottom, two side walls, a rear wall, a front plate, a pair of pull-out rails, each having a horizontal flange and to be mounted on said drawer adjacent a respective side thereof, and a pair of supporting rails, each to be mounted on a respective side of a furniture body and supporting a respective said pull-out rail for relative longitudinal sliding movement therebetween without substantial clearance and non-adjustably in vertical and lateral directions, the improvement comprising means at each side of said drawer for mounting a front end of the respective said pull-out rail to said drawer and for enabling vertical and lateral adjustment of said drawer relative to said pull-out rails, said mounting and adjustment means comprising:

an adjusting body positioned adjacent said front end of said respective pull-out rail, said adjusting body having therein a vertical guiding recess, a vertical opening, a vertical slot extending between said guiding recess and said vertical opening, and a vertical oblong hole elongated laterally in a direction parallel to the plane of said front plate;

a height adjustment screw mounted within said vertical opening and having a groove;

a holding body mounted within said guiding recess and movable vertically therein relative to said adjusting body, said holding body having a first projection supporting said front plate and a lateral projection extending through said vertical slot in said adjusting body and into said groove in said height adjustment screw, such that rotation of said height adjustment screw causes vertical movement of said holding body relative to said adjusting body, thereby causing vertical movement of said front plate and said drawer relative to said front end of said pull-out rail; and

a clamping screw extending through said oblong hole and threaded into said horizontal flange of said respective pull-out rail, such that tightening of said clamping screw clamps said adjusting body and thereby said front plate said drawer relative to said front end of said pull-out rail, and such that loosening of said clamping screw enables said adjusting body and thereby said front plate and said drawer to be moved laterally relative to said front end of said pull-out rail within limits defined by said oblong hole.

4,961,615

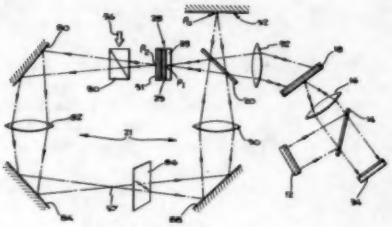
ASSOCIATIVE MEMORY SYSTEM WITH SPATIAL LIGHT MODULATOR

Yuri Owechko, Newbury Park, and Bernard H. Soffer, Pacific Palisades, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 64,979, Jun. 19, 1987, Pat. No. 4,860,253. This application May 24, 1989, Ser. No. 356,808

Int. Cl.[5] G03H *1/12*

U.S. Cl. 350—3.68 **3 Claims**



1. A method of associating and reconstructing a stored image stored in a hologram, in response to an input distorted image containing a portion of the stored image, the method comprising:

(a) providing a transformed version of the input distorted image to said hologram so as to generate a distorted reference beam;

(b) converting the distorted reference beam into a correlation function;

(c) providing the correlation function to a first spatial light modulator for modulating a readout beam in response thereto;

(d) thresholding the modulated readout beam in a positive feedback loop using a polarizer;

(e) feeding back the thresholded modulated readout beam to the first spatial light modulator for pseudo-conjugation;

(f) repetitively performing steps (a) through (e) until latching occurs and a stable thresholded conjugated signal is obtained;

(g) reading out the hologram with the stable thresholded conjugated signal so that the stored image is reconstructed at an output.

4,961,616

OPTICAL SEMICONDUCTOR DEVICE

Katsuhisa Tada, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 21, 1989, Ser. No. 410,496

Claims priority, application Japan, Jul. 13, 1989, 1-180966

Int. Cl.[5] G02B *6/32*

U.S. Cl. 350—96.2 **17 Claims**

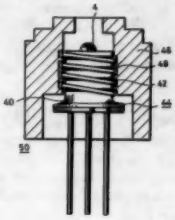
1. A packaged light-interactive semiconductor device comprising:

a light-interactive semiconductor element;

a stem on which the semiconductor element is mounted;

a metal cap attached to the stem and enclosing the semiconductor element, the cap including a generally cylindrical outer surface and a top surface with a lens mounted in the top surface opposite the semiconductor element; and

a generally cylindrical electrically conductive sleeve disposed around and secured to the outer surface including a



device thread for threadedly engaging a housing having a complementary housing thread.

4,961,617

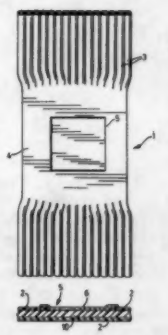
FIBRE OPTIC WAVEGUIDE ILLUMINATING ELEMENTS

Ferrydon Shahidi, and Joan Shahidi, both of 2144 A Danforth Ave., Toronto, Canada (M4C 1J9)

Filed Jul. 19, 1989, Ser. No. 381,954

Int. Cl.[5] G02B *6/00*; F21V *7/04*; G09F *13/00*; B29D *11/00*

U.S. Cl. 350—96.10 **33 Claims**



1. A fibre optic element comprising a sheet moulded from synthetic plastic material having high light transmissivity, two opposite edges of the sheet each having a coplaner extension formed with grooves or slots dividing the extensions into a plurality of separable flexible filaments extending longitudinally from said edges of the sheet, and the sheet and extension being substantially covered, except for distal ends of said filaments and at least one area on at least one side of the sheet via which light can escape, by an internally reflective layer which constrains light entering the element through said filamwents to propagate longitudinally of the filaments and in the plane of the sheet.

4,961,618

OPTICAL COMMUNICATION SYSTEM HAVING A WIDE-CORE SINGLE-MODE PLANAR WAVEGUIDE

Arthur K. Jordan, Alexandria, Va., and S. Lakshmanasamy, Dallas, Tex., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 5, 1989, Ser. No. 361,078

Int. Cl.[5] G02B *6/10*

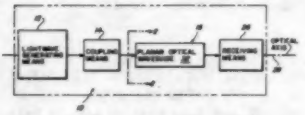
U.S. Cl. 350—96.12 **23 Claims**

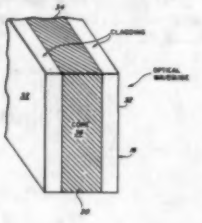
17. An optical wide-core planar waveguide for transmitting a single mode light wave source of preselected normalized frequency comprising:

inhomogeneous wide-core means of generally block-like solid-shaped configuration, the core means having one set of opposed sides and one set of opposed ends all of which are interconnected and also having transverse reflection characteristics as well as enhanced mode confinement and modal structure characteristics,

opposed cladding means for covering the one set of opposed sides of the core means, each cladding means having a constant permittivity ϵ_2, and

the wide-core means having a predetermined width and permittivity profile where the predetermined width is determined by selectively truncating an equivalent inhomogeneous quantum potential curve q(x), for single-mode light wave transmission in the core means and with the potential curve stemming from a mathematically-derived and computer-solved complex algorithmic function that involves a rational function representation of a nonzero transverse reflection coefficient having preselected multi-





pole values, a normalized permittivity difference profile curve of the core means as the result of determining both the predetermined width and the permittivity profile $\epsilon(x)$ thereof indicating the transmission characteristics of a substantially uniform signal of a single-mode light wave source of preselected center frequency from one opposed end of the opposed ends of the core means to the other opposed and thereof and to the one set of the opposed sides thereof where the permittivity profile $\epsilon(x)$ of the core means stems from another mathematically derived and computer solved complex algorithmic formula in relation to the preselected multi-pole values of a rational function representation of the nonzero transverse refection coefficient in conjunction with any selected width value of the core means up to its predetermined width such that any value of $\epsilon(x)$ for a selected width value of the core means is greater than the constant permittivity ϵ_2 the cladding means, the permittivity profile $\epsilon(x)$ of the core means being

$$\epsilon_2 - 2\frac{(\epsilon_1 - \epsilon_2)}{V^2}\left[a'^T(x) - a^T(x)A^{-1}(x)A'(x)\right]A^{-1}(x)b,$$

where $0 \leq x \leq 1$, $\epsilon_1 > \epsilon_2$, where V is the normalized frequency of the wave given by

$$V^2 = k_0^2 L^2(\epsilon_1 - \epsilon_2),$$

where k_0 the light-source wave number that is equal to $2\pi/\lambda$, where L is the full width of the waveguide core means, where a^T a transposed columnar matrix function that is made up of a series of six terms, where a' is a first derivative with respect to x, where b is another columnar matrix function that is made up of a series of six terms, where A is a six-by-six matrix that is made up of thirty-six terms with A^{-1} being the inverse of A, with A' being the first derivative of A with respect to x and with a^T being equal to

$$a^T(x) = [1 \; x \; e^{\eta_1 x} \; e^{-\eta_1 x} \; e^{\eta_2 x} \; e^{-\eta_2 x}],$$

where x is the transverse distance in the core means, where e is a standard constant that is the base for Napierian logarithms (e=2.71828 . . .), and where η_1 and η_2 is specified below, with b^T being equal to

$$b^T = [0\;0\;0\;0\;0 - a(c_1^2 + c_2^2)],$$

where the terms a, c_1 and c_2 being three reflection pole locations in the complex k-plane for the normalized frequency of the light wave; and A(x) being a six-by-six matrix:

$$\begin{bmatrix}
0 & 1 & 0 & 0 & 0 & 0 \\
0 & 0 & f(\eta_1) & a(c_1^2 + c_2^2) & 0 & 0 \\
0 & 0 & 0 & 0 & f(\eta_2) & a(c_1^2 + c_2^2) \\
1 & -x & e^{-\eta_1 x} & e^{\eta_1 x} & e^{-\eta_2 x} & e^{\eta_2 x} \\
1 & -1 & -\eta_1 e^{-\eta_1 x} & \eta_1 e^{\eta_1 x} & -\eta_2 e^{-\eta_2 x} & \eta_2 e^{\eta_2 x} \\
0 & 0 & \eta_1^2 e^{-\eta_1 x} & \eta_1^2 e^{\eta_1 x} & \eta_2^2 e^{-\eta_2 x} & \eta_2^2 e^{\eta_2 x}
\end{bmatrix}$$

where

$$f(\eta) = \eta^3 + (2c_2 - a)\eta^2 + [(c_1^2 + c_2^2) - 2ac_2]\eta - a(c_1^2 + c_2^2),$$

where

$$\eta_1 = [(\sigma + \rho)/2]^{\frac{1}{2}},$$

where

$$\eta_2 = [(\sigma - \rho)/2]^{\frac{1}{2}},$$

with $f(\eta) = f(\eta_1)$ or $f(\eta_2)$ as required in the above matrix, and where

$$\sigma = a^2 + 2c_2^2 - 2c_1^2, \text{ and } \rho = \sqrt{(a^2 - 4c_2^2)(a^2 + 4c_1^2)},$$

with the predetermined width, L, of the wide-core means being a function of

$$\frac{V}{k_0\sqrt{\epsilon_1 - \epsilon_2}}$$

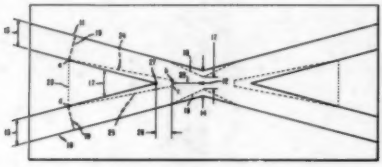
where k_0 is the light-source wave number that is equal to $2\pi/\lambda$ with λ being the wavelength, where V is the normalized or center frequency of a single-mode light wave source in Hertz per second, and where ϵ_1 is the maximum value of $\epsilon(x)$ for a given core means.

4,961,619

LOW LOSS WAVEGUIDE INTERSECTION

Jose F. Hernandez-Gil, Matawan; Steven K. Korotky, Toms River; Timothy O. Murphy, and John J. Veselka, both of Freehold, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 2, 1989, Ser. No. 318,044
Int. Cl.[5] G02B 6/10
U.S. Cl. 350—96.12 10 Claims



1. An optical intersection comprising

at least two waveguides which intersect to form a region of intersection

each of the at least two waveguides, as it approaches the region of intersection, being in sufficiently close proximity to the other of the at least two waveguides, so as to distort asymmetrically the electro-magnetic field configuration associated with light transmitted in the said other of the at least two waveguides

the invention characterized in that

the optical intersection further comprises

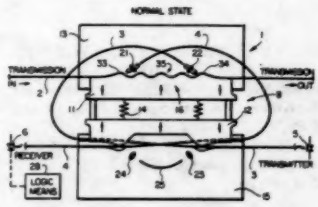
means for reducing the said distortion comprising an axial variation in the transverse index of refraction distribution of the said waveguides as the said waveguides approach the intersection region.

4,961,620

OPTICAL BYPASS SWITCH

William D. Uken, Fremont, and Akira Tomita, Redwood City, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Dec. 20, 1989, Ser. No. 455,200
Int. Cl.[5] G02B 6/28, 6/42
U.S. Cl. 350—96.15 6 Claims



1. An optical bypass switch, comprising:

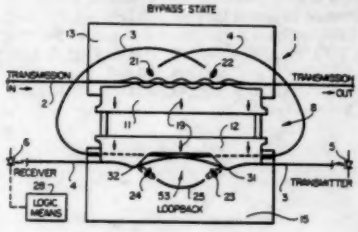
an optical receiver;

an optical transmitter;

means for withdrawing a first optical signal from a first bend in a transmission optical fiber at a first location and transmitting the first optical signal to the receiver;

means for injecting a second optical signal from the transmitter into the transmission optical fiber at a second bend at a second location downstream of the first location on the transmission optical fiber;

bypass means for disengaging the withdrawing means and the injecting means from the transmission fiber in a bypass state so that the first optical signal can be transmitted past



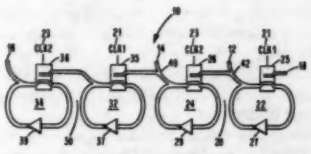
the withdrawing and injecting means, the bypass means including connector means for connecting the transmitter with the receiver so that signals transmitted by the transmitter can be detected by the receiver in the bypass state.

4,961,621

OPTICAL PARALLEL-TO-SERIAL CONVERTER

Shing-Fong Su, Southboro, Mass., assignor to GTE Laboratories, Inc., Waltham, Mass.

Filed Dec. 22, 1988, Ser. No. 288,583
Int. Cl.[5] G02B 6/28; G11C 19/00; G06F 1/00; H04J 3/00
U.S. Cl. 350—96.16 13 Claims



1. An optical parallel-to-serial converter, comprising:

optical input means adapted to simultaneously receive sets of N optical pulses;

optical storage means comprising:

N−1 single bit optical shift registers, each of said shift registers having an input port adapted to receive optical pulses and an output port adapted to output optical pulses responsive to control signals;

means to optically couple said N−1 optical shift registers in cascade such that the output port of one optical shift register is optically coupled to the input port of the next sequential optical shift register in said cascade;

each of said single bit optical shift registers having means to optically store and optically shift a single optical pulse responsive to control signals; and

means to load and shift all but one of a set of N parallel optical pulses received at the inputs of said optical converter into said cascaded optical shift registers so that each of said N−1 optical shift registers has stored one of said optical pulses;

said optical storage means being optically coupled to said optical input means and adapted to store temporarily all but one of said optical pulses of a set as received;

optical output means optically coupled to said optical storage means adapted to output serially all of said N optical pulses, commencing with a first optical pulse as soon as said N optical pulses have been received; and

control means adapted to provide signals to control the input, storage and output of said optical pulses.

4,961,622

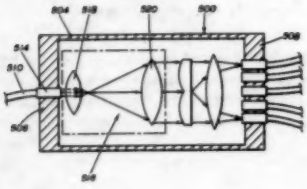
OPTICAL COUPLER AND REFRACTIVE LAMP

Michael A. Gorman; Mark H. Sterling; Robert M. Kiehn, and Lowell T. Wood, all of Houston, Tex., assignors to University of Houston - University Park, Houston, Tex.

Continuation-in-part of Ser. No. 160,164, Feb. 25, 1988, Pat. No. 4,834,484, which is a continuation-in-part of Ser. No. 71,493, Jul. 9, 1987, Pat. No. 4,842,393. This application Feb. 17, 1989, Ser. No. 312,624

Int. Cl.[5] G02B 6/32, 3/00; F21V 5/00; H04B 9/00

U.S. Cl. 350—96.18 27 Claims



1. A multiple channel optical fiber coupler, comprising:

first mounting means for receiving, on a reference axis, a transmissive end of a first optical fiber transmitting a first channel of data;

second mounting means for receiving on said axis a transmissive end of a second optical fiber receiving said first channel of data;

third mounting means for receiving on said axis a transmissive end of a third optical fiber for transmitting a second channel of data;

fourth mounting means for receiving on said axis a transmissive end of a fourth optical fiber for receiving said second channel of data;

first transmissive means including a refractive device for conservatively transmitting light from said first optical fiber in a geometric distribution about said axis;

second transmissive means including a refractive device for receiving said geometrically distributed light and conservatively transmitting said light to said second optical fiber;

third transmissive means including a refractive device for conservatively transmitting light along said axis from said third optical fiber; and

fourth transmissive means including a refractive device for receiving said light from said third transmissive means and conservatively transmitting said light to said fourth optical fiber,

wherein said third and fourth mounting means and said third and fourth transmissive means are located along said axis between said first and second transmissive means, and

wherein said geometric light distribution surrounds said third mounting means, said third transmissive means, said fourth transmissive means, and said fourth mounting means.

18. A lamp apparatus for indirect lighting, comprising:

a light source; and

a refractive device having an optical axis and which can receive light from said light source and conservatively transmit substantially all of said light to a cylindrical target surface having inner walls parallel to said optical axis of said refractive device and which can exclude all such light from a desired dark area on the optical axis of said refractive device.

4,961,623

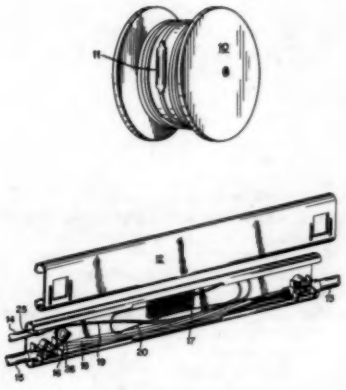
PRETERMINATED OPTICAL CABLE

John A. Midkiff, Charlotte; Cyril A. Yancey, Conover, and Robert W. Pollock, Hickory, all of N.C., assignors to Siecor Corporation, Hickory, N.C.

Filed Sep. 5, 1989, Ser. No. 402,762

Int. Cl.[5] G02B 6/36

U.S. Cl. 350—96.20 7 Claims



1. A preterminated optical cable, comprising:

(a) a receptacle having opposing first and second openings;

(b) a first tube entering the receptacle first opening and secured to the receptacle;

(c) a second tube and a third tube, the second and third tubes entering the receptacle second opening and secured to the receptacle;

(d) a first set of optical fibers which (i) are carried by the first and second tubes, and (ii) proceed through the receptacle between the first and second tubes;

(e) a second set of optical fibers carried by the first tube and a third set of optical fibers carried by the third tube, the second and third set of optical fibers in optical communication with each other in the receptacle; and

(f) a reel on which the receptacle, first tube, second tube, and third tube are placed for shipment.

4,961,624

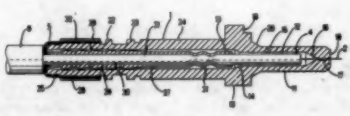
OPTICAL FIBER TERMINATION WITH CRIMPING BODY

Wallace R. Savitsky; Ronald R. Schaffer, and Gary N. Warner, all of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 29, 1989, Ser. No. 400,303

Int. Cl.[5] G02B 6/26

U.S. Cl. 350—96.20 11 Claims



1. A termination for optical members comprising, a connector and an optical fiber member having a flexible buffer and an optical fiber, wherein the connector comprises, an alignment ferrule having a tubular passageway for encircling the buffer

and the optical fiber, and a tip with a centrally disposed aperture therethrough for closely receiving an end of the optical fiber extending from the passageway, wherein the improvement comprises;

a crimping body of deformable material intimately surrounding the buffer and the optical fiber and attached by crimping thereto and engaged by compression fitting, together with the buffer and the optical fiber, within the passageway and against walls of the passageway to provide a fit resistant to disengagement,

the crimping body being in the shape of a series of stacked, truncated, cone shaped sections with annular lips at outer circumferences of the sections and having a central passageway for receiving the optical fiber and engaged by compression fitting of the lips against the walls of the tubular passageway.

4,961,625

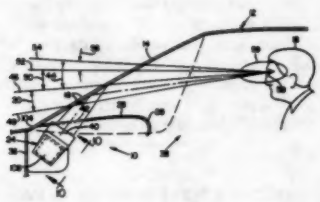
AUTOMOBILE HEAD-UP DISPLAY SYSTEM WITH REFLECTIVE ASPHERIC SURFACE

Robert B. Wood, Hillsboro; Mark A. Thomas, Lake Oswego, and John P. Desmond, Portland, all of Oreg., assignors to Flight Dynamics, Inc., Portland, Oreg.

Continuation of Ser. No. 98,528, Sep. 18, 1987, abandoned. This application Sep. 15, 1989, Ser. No. 409,954

Int. Cl.[5] G02B *27/10, 9/06, 13/18*

U.S. Cl. 350—174 **10 Claims**



1. An optical display system for presenting visual information to an observer, comprising:

a vision unit through which the observer can view an outside world scene, the vision unit having a reflective aspheric surface with a curvature characterized by vision unit sag properties;

information source means for providing source information carried by light propagating along an optical path for reflection by the reflective surface of the vision unit for display to an observer; and

projection lens means for projecting the source information at a finite projection distance and predetermined size for display to the observer and for compensating for aberrations caused by the reflective aspheric surface of the vision unit so that the light reflected by it is of substantially aberration-free character for viewing by the observer,

the projection lens means including first and second lens sections positioned along the optical path between the reflective surface and the information source means, the first lens section including a rotationally nonsymmetric optical element characterized by the vision unit sag properties to compensate for nonsymmetric aberrations introduced by the reflective aspheric surface of the vision unit and the second lens section characterized by optical light directing properties that affect the projection distance and the size of the source information and that compensate for other optical aberrations present in the optical display system, thereby to provide projection lens means in which the second lens section is substantially independent of vision unit sag properties and is compatible with vision units having different sag properties.

4,961,626

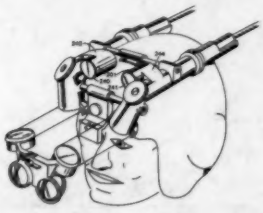
DIRECT INCORPORATION OF NIGHT VISION IN A HELMET MOUNTED DISPLAY

Joseph T. Fournier, Jr., Glastonbury; Stephen J. Smith, Simsbury, both of Conn.; Harry R. McKinley, Southampton, Mass., and William E. McLean, Aberdeen, Md., assignors to United Techologies Corporation, Hartford, Conn.

Filed Feb. 21, 1989, Ser. No. 313,686

Int. Cl.[5] G02B *27/14, 23/12*

U.S. Cl. 350—174 **47 Claims**



1. Helmet mounted apparatus for use in a display system, comprising:

a helmet, adapted to be worn by an observer, having an outer surface with an opening provided in proximity to the eyes of the observer;

a first image source disposed on said helmet to provide an image;

relay optic means, comprising a plurality of optical components and being disposed on said helmet outer surface, for receiving the image from said first image source at an entrance pupil thereof and for guiding the image along an optical path to an intermediate image focal plane located in proximity to said outer surface opening, said plurality of optical components including a first lens disposed along the optical path at a predetermined distance from said first image source, said relay optic means being adapted to engage an eyepiece;

a second image source disposed on said helmet to provide an image;

an optical beamsplitter component disposed in the optical path between said first image source and said first lens both to reflect the image provided by said second image source in a direction along the optical path toward said first lens and to transmit the image from said first image source along the optical path toward said first lens, an optical path distance from said second image source to said first lens being equal to the predetermined optical path distance from said first image source to said first lens, said beamsplitter component being so spatially positioned as to effectively superimpose the image from said second image source upon the image from said first image source, the image in proximity to said intermediate image focal plane being a focused form of the superimposed image at said first lens; and

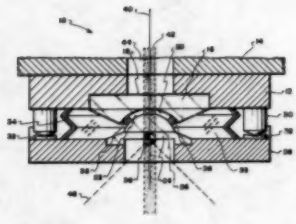
eyepiece means for receiving the superimposed image from said intermediate image focal plane at an input aperture thereof and for presenting, in the observer's forward field of view, the superimposed image as focused in the optical path in proximity to said intermediate image focal plane, said eyepiece means being adapted to releasably engage said relay optic means, said eyepiece means, when engaged, receiving the superimposed image from said intermediate image focal plane and presenting the image in the observer's forward field of view.

4,961,627

TWO-AXIS BEAM STEERING APPARATUS

David M. Swain, Thousand Oaks; Gregory A. Needham, Simi Valley, and Louis R. Fontana, Canoga Park, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 29, 1988, Ser. No. 237,200
Int. Cl.[5] G02B 7/22, 7/02
U.S. Cl. 350—319 8 Claims



1. An apparatus for steering a light beam in two orthogonal tilt axes, said light beam having an optical axis, comprising:

a transmissive, stationary window for receiving the light beam desired to be steered, said stationary window having a flat entrance surface and a semi-spherical exit surface on the opposite side thereof;

a transmissive, rotatable window, said rotatable window having a semi-spherical entrance surface and a flat exit surface on the opposite side thereof, said semi-spherical entrance surface having a radius of curvature substantially equal to that of the semi-spherical exit surface of said stationary window, the semi-spherical exit surface of the stationary window being separated from the semi-spherical entrance surface of the rotatable window by a desired gap;

mounting means, including a stationary housing for supporting said stationary window and a rotatable housing for supporting said rotatable window, to maintain said desired gap and for pivoting said rotatable window about a point of rotation defined by the intersection of said optical axis and the exit surface of said rotatable window, said gap being minimized to provide for minimal refraction of light traveling therethrough yet sufficiently wide to allow non-contact relative motion between the stationary window and the rotatable window;

a plurality of linear actuator means located between said stationary and rotatable housings and equidistantly disposed about the periphery of said rotatable and stationary windows, attached to said stationary housing and being capable of imparting a force to the rotatable housing; and

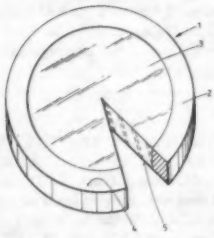
a flexible seal for containing a fluid completely filling said gap, said fluid for transmitting said light beam from said stationary window to said rotatable window, the direction of the light beam remaining substantially constant as it leaves the exit surface of the stationary window, is transmitted through said fluid, and enters said rotatable window, but being steered in a desired direction as it descends from the exit surface of the rotatable window.

4,961,628

MEANS FOR OBSERVING GAS-TIGHT AND PRESSURE-TIGHT CLOSED CHAMBERS

Kurt-Dieter Herberts, Wuppertal, Fed. Rep. of Germany, assignor to Herberts Industrieglas GmbH & Co. KG, Wuppertal, Fed. Rep. of Germany

Filed Oct. 17, 1989, Ser. No. 422,691
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1988, 8813504[U]
Int. Cl.[5] G02B 5/00, 27/02
U.S. Cl. 350—319 8 Claims



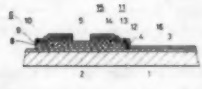
1. In a viewing window assembly for observing the interior of a gas-tight and pressure-tight closed chamber of an installation such as, for example, reactor apparatus, a pressure vessel, or pipework from outside, said assembly comprising a cylindrical frame which is machined out and made of metal, and a transparent insert arranged within said frame, wherein the improvement comprises that said frame is made of a stainless steel of low coefficient of thermal expansion and said insert is made of a glass having a coefficient of thermal expansion which is not greater than that of said frame.

4,961,629

LIQUID CRYSTAL DISPLAY DEVICE

Hiroaki Kato, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 28, 1988, Ser. No. 250,370
Claims priority, application Japan, Nov. 6, 1987, 62-281383
Int. Cl.[5] G02F 1/13
U.S. Cl. 350—332 16 Claims



1. A liquid crystal display device comprising:

a plurality of thin film transistors formed on a transparent insulating substrate, in which each of the thin film transistors includes,

a gate electrode formed on the transparent insulating substrate,

a semiconductor film formed on the gate electrode by the mediation of a gate insulation film,

a protective insulating film formed on the semiconductor film,

a metal thin film laminated on the protective insulating film to provide a source electrode and a drain electrode, and

a transparent conductive film laminated on said metal thin film to subsequently pattern said source and drain electrode thereon, said transparent conductive film for said drain electrode being extended to form a pixel electrode.

7. A method of forming a plurality of thin film transistors

(TFT) on a transparent insulating substrate, each of said TFTs formed by a method comprising the steps of:

(a) forming a gate electrode on the transparent insulating substrate;

(b) forming a semiconductor film on the gate electrode by the mediation of a gate insulating film covering said gate electrode;

(c) forming a protective insulating film on said semiconductor film;

(d) laminating thin metal film onto said insulating film, thereby forming a source and drain electrode; and

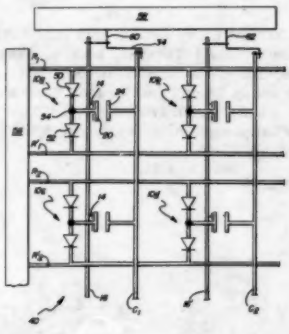
(e) laminating and patterning transparent conductive film onto said thin metal film thereby patterning the source and drain electrode and forming a pixel electrode from said transparent conductive film patterning said drain electrode.

4,961,630

LIQUID CRYSTAL DISPLAY WITH AUXILIARY PIXEL CAPACITANCE INTERCONNECTED THROUGH SUBSTRATE

Yair Baron, Southfield, and Zvi Yaniv, Farmington Hills, both of Mich., assignors to Ovonic Imaging Systems, Inc., Troy, Mich.

Filed Mar. 15, 1989, Ser. No. 323,701
Int. Cl.[5] G02F *1/13*
U.S. Cl. 350—333 **28 Claims**



1. A light-influencing display, said display comprising:

a first transparent substrate and a second, spacedly disposed transparent substrate;

a first pixel electrode disposed upon said first transparent substrate;

means for addressing said first pixel electrode, said first electrode addressing means disposed on said first substrate;

a second pixel electrode disposed upon said second transparent substrate;

means for addressing said second pixel electrode, said second electrode addressing means disposed on said second substrate;

light influencing liquid crystal material disposed electrically in series between said first and second pixel electrodes;

said electrodes and liquid crystal display material providing a first pixel capacitance between said first and second electrodes;

means, spacedly disposed relative to the first and second pixel electrodes, adapted to provide an auxiliary pixel capacitance, said auxiliary capacitance means in parallel with said first pixel capacitance;

at least one via formed through said second substrate, said via adapted to facilitate electrical communication between said second pixel electrode and said auxiliary capacitance means; and

means electrically interconnecting said auxiliary capacitance means and said second pixel addressing means, said electrical interconnecting means extending through the via formed through the second transparent substrate.

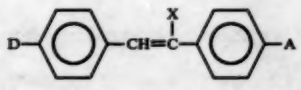
4,961,631

NONLINEAR OPTICAL DEVICES FROM DERIVATIVES OF STILBENE

Robert A. Clement; Wilson Tam, and Ying Wang, all of Wilmington, Del., assignors to E. I Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 155,024, Feb. 11, 1988, abandoned.
This application Nov. 16, 1989, Ser. No. 436,975
Int. Cl.[5] G02B *5/23;* G03H *1/02;* F21V *9/00*
U.S. Cl. 350—354 **8 Claims**

1. A nonlinear optical device capable of second harmonic generation comprising a nonlinear optical element, a source of coherent optical radiation, and means to direct the coherent beam of radiation into the nonlinear optical element, said nonlinear optical element comprising a compound having the general formula



wherein A or D is NO_2 and, correspondingly,

D or A is selected from the group consisting of F, Cl, Br, I, CHO and OR where R is selected from the group consisting of H, C_1–C_{10} branched or unbranched alkyl, and C_1–C_{10} branched or unbranched hydroxyalkyl, and

X is selected from the group consisting of F, Cl, Br, I, CN, C_1–C_4 branched or unbranched alkyl;

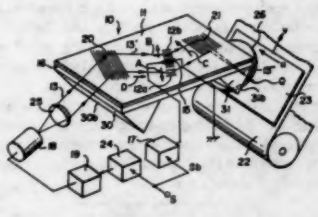
said compound being crystallized in a noncentrosymmetric space group, provided when X is CN, then (1) A is selected from the group consisting of CHO and OR and D is NO_2 or (2) D is selected from the group consisting of CHO and OR and A is NO_2.

4,961,632

LIGHT BEAM DEFLECTOR/MODULATOR

Masami Hatori, and Nobuharu Nozaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 23, 1988, Ser. No. 288,837
Claims priority, application Japan, Dec. 29, 1987, 62-335501; Dec. 29, 1987, 62-335502
Int. Cl.[5] G02F *1/11, 1/33*
U.S. Cl. 350—358 **6 Claims**



1. A waveguide-type light deflector for deflecting a light beam, comprising:

(i) an optical waveguide for guiding a light beam therethrough along a light path;

(ii) a first coupler, disposed on said optical waveguide, for introducing light into said optical waveguide;

(iii) a second coupler, disposed on said optical waveguide for emitting said light from said optical waveguide;

(iv) an interdigital transducer, disposed between said first and second couplers, for generating surface elastic waves in said optical waveguide to diffract said light beam and for propagating the surface elastic waves in opposite directions across said light path, said interdigital transducer being transversely disposed to said light path in a substantially central position in said light path; and

(v) means for applying an alternating voltage with a continuously varying frequency to said interdigital transducer to enable said surface elastic waves to continuously diffract and deflect said light beam.

4,961,633

VLSI OPTIMIZED MODULATOR

Abd-el-Fattah A. Ibrahim, Palos Verdes Estates, and Hugh P. Campbell, Gardena, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 22, 1988, Ser. No. 158,507

Int. Cl.[5] G02F *1/03*

U.S. Cl. 350—392 **8 Claims**

1. A multi-gate electro-optic modulator constructed in an integrated circuit package comprising:

an integrated circuit package comprising a flat upper surface and a hollow area located within said flat surface and accompanying electric signal lead connections emanating from within said hollow area of said integrated circuit package body,

at least one first integrated circuit means mounted in the hollow area, said integrated circuit means including a plurality of electrically conductive electrodes in spaced apart relationship in a predetermined pattern and a plurality of electric lead connections connected to said lead connections of said package, said integrated circuit means being aligned in a predetermined aspect within said integrated circuit package,

electro-optic element means mounted on said flat surface, and partially overlapping said hollow area of said package, containing electrically conductive electrodes which are adapted to contact the electrodes on said integrated circuit means so as to produce electric fields into said electro-optic element means, said electro-optic element means comprising a layer of optically transparent electro-optically responsive crystal,

a layer of resilient compressed material between the bottom of the hollow area of said package and the bottom of said integrated circuit means for applying equal pressure to press the electrodes of the integrated circuit means and electro-optic element means into contact,

a layer of glass or similar protection means mounted on the top surface of said electro-optic element means for protection of said electro-optic element means, and

glue for cementing the edges of said crystal to the flat upper surface of said package.

4,961,634

INFRARED ACHROMATIC RETARDER

Russell Chipman, Madison, and David Chenault, Huntsville, both of Ala., assignors to The University of Alabama in Huntsville, Huntsville, Ala.

Filed Jun. 14, 1989, Ser. No. 365,795

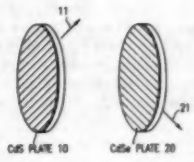
Int. Cl.[5] G02B *5/30*

U.S. Cl. 350—403 **4 Claims**

1. An achromatic retarder for shifting two orthogonal polarization components, with respect to each other, of an incident light beam;

a first waveplate made of substantially cadmium sulfide having a fast axis;

a second waveplate made of substantially cadmium selenide having a fast axis wherein said first and second plates are oriented so that said fast axis of said first plate is at a right



angle with respect to said fast axis of said second plate and wherein said first plate produces a retardance of a first polarization state with respect to a second polarization state while said second plate produces a retardance of said second polarization state with respect to said first polarization state to produce a net retardance which has a substantially constant value over a range of wavelength values of interest for said light beam.

4,961,635

ZOOM LENS DRIVE MECHANISM

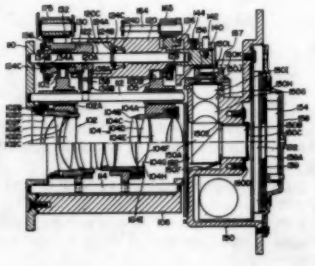
Shigeru Kondo; Naoki Takatori, both of Tokyo; Masaaki Morizumi, Omiya, and Shino Kanamori, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 25, 1989, Ser. No. 398,684

Claims priority, application Japan, Sep. 6, 1988, 63-223139; Sep. 6, 1988, 63-223145

Int. Cl.[5] G02B *15/14, 7/04*

U.S. Cl. 350—429 **9 Claims**



1. A zoom lens drive mechanism comprising:

first and second groups of lenses respectively disposed movably in an optical axis direction to form a zoom lens;

a zoom shaft disposed in parallel with the optical axis of said zoom lens;

a zoom cam ring disposed rotatably on said zoom shaft and including first and second cam grooves in the periphery thereof;

a first lens group drive means disposed on said zoom shaft such that it is free to move in the axial direction of said zoom shaft; and,

a focus cam means movable in the axial direction of said zoom shaft together with said first lens group and free to move with respect to said first lens group drive means, said focus cam means having a cam groove, wherein two cam followers respectively provided in said first lens group drive means and in said second lens group are

respectively brought into engagement with said first and second cam grooves in said zoom cam ring, a cam follower provided in said first lens group is brought into engagement with said cam groove formed in said focus cam means, said zoom cam ring is rotated to thereby move said first and second lens groups in the optical axis direction with a constant relation being maintained therebetween, and said focus cam means is moved to thereby move said first lens group in the optical axis direction.

4,961,636

REVOLVING NOSE PIECE FOR OPTICAL COMPONENTS AND PROCESS FOR ADJUSTING THE NUMBER OF REVOLUTIONS THEREOF

Norbert Gaul, Solms; Guenter Reinheimer, Biebertal, and Peter Weimar, Staufenberg, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

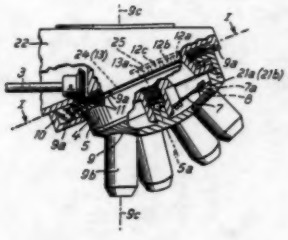
PCT No. PCT/DE88/00080, § 371 Date Nov. 9, 1988, § 102(e) Date Nov. 9, 1988, PCT Pub. No. WO88/07217, PCT Pub. Date Sep. 22, 1988

PCT Filed Feb. 18, 1988, Ser. No. 276,048

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1987, 3707593; Apr. 8, 1987, 3711843

Int. Cl.[5] G02B *21/00, 7/02*

U.S. Cl. 350—520 **15 Claims**



1. Rotating turret device with a number of optical components in which each optical component can be brought into operating position individually, comprising:

(a) a turret having an axis;

(b) an encoding device for the indexing or pre-selection of a specific optical component to be brought into operating position,

(d) locating means for positioning the optical component in operating position,; and

(e) marking means for marking the location of the turret and controlling the speed of the turret as a function of its particular relative location with regard to a pre-selected location of the operating position, wherein the motor drive device comprises an electromotor with a coupled tachometer generator, which device is connected with the turret.

4,961,637

REAR VIEW LENS APPARATUS FOR AUTOMOTIVE VEHICLE

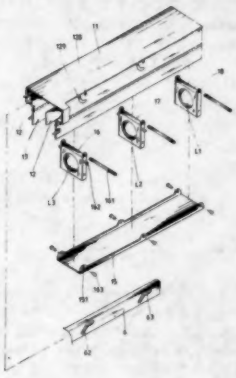
Jan-Chou Ou, 5F, 2, Alley 7, Lane 100, Tun Hwa South Road, Taipei, Taiwan

Filed Oct. 14, 1988, Ser. No. 258,170

Int. Cl.[5] G02B *7/02, 23/08*

U.S. Cl. 350—573 **1 Claim**

1. A viewing means for an automotive vehicle comprising an optical conduit, said optical conduit having a fixed top wall, a movable bottom wall, two fixed upper side walls, a rectangular lens frame having lateral sides, said lens frame disposed on said upper side walls, a reflecting mirror disposed in front of said optical conduit, a plurality of convex lenses disposed in said rectangular lens frame so as to project images, viewable from the rear of the automotive vehicle, forward to said reflecting mirror, a pair of slidable actuating frames disposed longitudinally outside said upper side walls, a linkage disposed on each side of said actuating frames, two foldable side walls each having a front edge, a side wall stud pin disposed on each of said foldable side walls, a lateral side stud pin disposed on each lateral side of said lens frame, a plurality of curved slots disposed on said actuating frames, a rocker arm engageable at one end with one of said slots and at the other end with said side wall stud pin, said slots engageable with said lateral side stud



pins, a handle disposed on one of said upper side walls, said handle connectable through said linkage to said actuating frame, said optical conduit being fixable to an underside roof section of an automotive vehicle such that a rear end of said optical conduit faces a rear window of the vehicle, whereby upon movement of said handle from a horizontal to a vertical position, said actuating frame moves said foldable side walls and said lens frame from a horizontal to a vertical position, and upon movement of said handle from a vertical to a horizontal position, said actuating frame moves said foldable side walls and said lens frame from a vertical to a horizontal position.

4,961,638

INTERNAL REARVIEW MIRROR WITH AN ADJUSTABLE SUPPORT FOR MOTOR VEHICLES

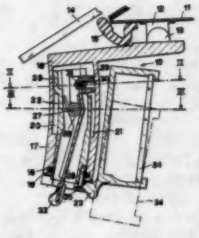
Domenico D'Aquaro, Arese, and Luigi Petrelli, Legnano, both of Italy, assignors to Alfa Lancia Industriale S.p.A., Arese, Italy

Filed Mar. 6, 1989, Ser. No. 318,953

Claims priority, application Italy, Mar. 10, 1988, 19718 A/88

Int. Cl.[5] G02B *5/08*

U.S. Cl. 350—632 **5 Claims**



1. An inner rearview mirror for a motor vehicle, said inner rearview mirror comprising a support and a mirror having a frame, said support having a pair of ends, said support being

secured at one end to a fixing base and at its other end to the mirror frame, said support further consisting of an outer tube and an inner tube, one of said tubes being rigid with said fixing base and the other of said tubes being rigid with the mirror frame, said outer and inner tubes being engaged with each other by way of mutual guide and locking means, wherein said locking means consist of a locking groove and an operating lever provided with a locking pad arranged to engage the outer tube under the action of a spring.

4,961,639

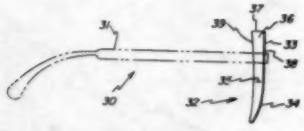
PRISM SECTION LENS SPECTACLES

Stuart M. Lazarus, 58 Hunterfield Rd., Delmar, N.Y. 12054

Filed Jun. 30, 1989, Ser. No. 374,544

Int. Cl.[5] G02C *7/06*

U.S. Cl. 351—41 **9 Claims**



1. An optical lens having a slab-off prism including a slab-off line passing transversely through said lens to define upper and lower viewing sections oppositely adjoining said slab-off line, and a second prism, said slab-off prism and said second prism forming a dual prism combination lens and being incorporated only in the upper viewing section.

4,961,640

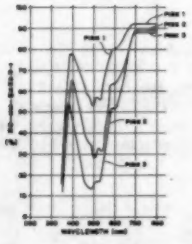
METHOD AND APPARATUS OF TREATMENT OF SYMPTOMS OF THE IRLEN SYNDROM

Helen L. Irlen, 4242 Country Club Dr., Long Beach, Calif. 90807

Continuation of Ser. No. 410,045, Aug. 20, 1982, abandoned. This application Jul. 19, 1985, Ser. No. 756,935

Int. Cl.[5] G02C *7/10*; A61B *3/00*

U.S. Cl. 351—44 **18 Claims**



1. A method for the treatment of perceptual impairments caused by scotopic sensitivity, comprising the steps of:

identifying and characterizing symptomatic indicia of said perceptual impairments;

sequentially interposing one or more optical filters between the eye of a patient having said perceptual impairments and an object perceived with said impairments, each said optical filter having a percentage attenuation of at least 60% at selected wavelengths within the range above 425 and below 575 nanometers and having a substantially higher transmittance at wavelengths above 575 nanometers and below 425 nanometers, with the transmittance at 575 nanometers being greater by at least a factor of 2 than the minimum transmittance in the range between 425 and 575 nanometers, said filters being graduated with respect to each other in their spectral characteristics;

comparing the symptomatic indicia of said perceptual impairments when viewing through each optical filter with said symptomatic indicia when not viewing through the optical filter to determine if said symptomatic indicia have been ameliorated; and

identifying the filter or combination of filters that minimizes said symptomatic indicia to generate a prescription for the optimum filter for the patient.

4,961,641

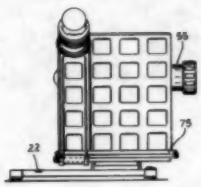
SLIDE PROJECTOR WITH ERGONOMIC SLIDE SELECTION AND ACCESS

Leon Segal, and Jonathan Bar-Or, both of 9 E. Hartwell Ct., Savoy, Ill. 61874

Filed Nov. 29, 1989, Ser. No. 443,721

Int. Cl.[5] G03B *21/12, 21/64*

U.S. Cl. 353—27 R **7 Claims**



1. A slide projector comprising:

a base;

a planar light table;

means for mounting said light table above said base at an inclination thereto and at an angle of about 60° to the horizontal, said table being formed with a single window;

a planar carriage tray formed with a first plurality of windows;

means for slidably mounting said carriage tray on a front side of said light table, said tray being displaceable parallel to said light table in any direction for bringing any of said first plurality of windows into registration With said single window;

a projection lamp mounted on the front side of said light table in registration with said single window for directing a beam of light therethrough perpendicular to said table;

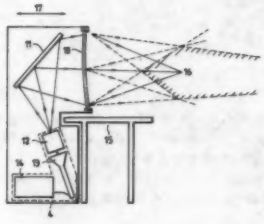
a projection lens and mirror assembly mounted on a back side of said light table with the optical axis of said lens lying parallel thereto and said mirror in registration with said single window for receiving said beam of light and directing same to said lens; and

a planar slide holder formed with a second plurality of windows and removably disposed in said carriage tray between said projection lamp and said tray, with said second plurality of windows in registration with said first plurality of windows, whereby said beam of light from said lamp traverses any slide brought into registration with said single window for the projection thereof, the illumination from said light table providing back-lighting to any other slides in said slide holder for previewing thereof.

4,961,642
PROJECTION TYPE DISPLAY DEVICE FOR MONITORING AT SHORT DISTANCE

Masanori Ogino, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 30, 1989, Ser. No. 374,147
Claims priority, application Japan, Jul. 18, 1988, 63-177125
Int. Cl.[5] G03B *21/60, 21/14*
U.S. Cl. 353—38 **5 Claims**

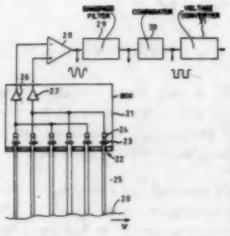


1. A projection type display device for short distance monitoring wherein images based on light projected from a projection source are formed on a screen, said screen comprising a first Fresnel sheet means, a second Fresnel sheet means and a lenticular sheet means, which are arranged successively in this order from a light incidence side toward a light exit side, wherein said first Fresnel sheet means has a Fresnel lens surface on the light exit side, the sheet surface of said first Fresnel sheet means has a microscopically concave portion to diffuse light microscopically in a range within about 10°, and said second Fresnel sheet means has a Fresnel lens surface on the light incidence side and converges a principal portion of the exit light so that a light exit-side conjugate point thereof is at a distance within about twice the height of the screen.

4,961,643
METHOD OF AND APPARATUS FOR MEASURING SPEED

Izumi Sakai, Solihull; Gabriel Donaldson, Birmingham, and Nicholas J. Chilton, Warley, all of Great Britain, assignors to Lucas Industries Public Limited Company, Birmingham, Great Britain

Filed Feb. 8, 1989, Ser. No. 307,538
Claims priority, application United Kingdom, Feb. 17, 1988, 88 03683
Int. Cl.[5] G01P *3/36*
U.S. Cl. 356—28 **11 Claims**



1. An apparatus for measuring speed relative to a co-operating surface, said apparatus comprising:

a plurality of photodetector means for viewing light passing along substantially parallel paths from consecutive regions of said co-operating surface, said plurality of photodetector means comprising an array aligned parallel to a direction of travel between said apparatus and said cooperating surface, said substantially parallel paths in one region are substantially parallel to substantially parallel paths in an adjacent region, each of said photodetector means comprising means responsive to light reflected from a respective one of the consecutive regions within a beam of substantially constant cross-sectional area and shape extending from the respective one of the consecutive regions to said photodetector means, said plurality of photodetector means comprising first and second sets of photodetector means, said first set comprising a means for viewing alternate regions of the co-operating surface;

first means for forming a first combined output of said first set;

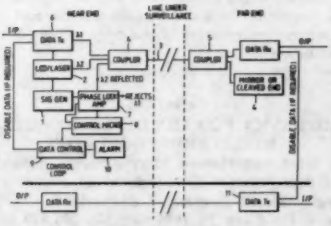
second means for forming a second combined output of said second set; and

subtracting means for forming the difference between the first combined output and the second combined output.

4,961,644
TRANSMISSION LINE SURVEILLANCE SYSTEM MEASURING CHANGES IN PHASE OF PROPAGATED SIGNALS

Stephen A. Marsden, Bury St Edmunds, England, assignor to British Telecommunications public limited company, Great Britain

PCT No. PCT/GB88/00327, § 371 Date Jan. 19, 1989, § 102(e) Date Jan. 19, 1989, PCT Pub. No. WO88/08651, PCT Pub. Date Nov. 3, 1988
PCT Filed Apr. 27, 1988, Ser. No. 303,669
Claims priority, application United Kingdom, Apr. 27, 1987, 8709900
Int. Cl.[5] G01N *21/88*
U.S. Cl. 356—73.1 **32 Claims**



1. A surveillance method comprising the following steps:

(a) generating a cyclically varying signal,

(b) modulating an optical beam with said signal and launching the beam into an optical fibre,

(c) comparing at least part of the signal after transmission along said fibre with a reference signal related to the cyclically varying signal so as to determine a phase difference,

(d) later repeating said steps (a)–14 (c) to determine a further phase difference, and

(e) determining the occurrence of changes in the phase of the cyclically varying signal occurring in transmission along the fibre in response to said determined phase differences.

4,961,645

ELECTROTHERMAL ATOMIZATION FURNACE

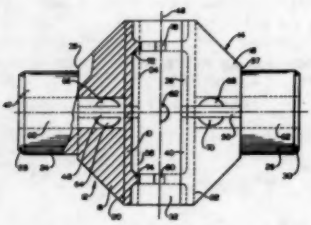
Gerhard C. U. Schlemmer, Owingen; Rolf Tamm, Salem, and Gunther Roedel, Owingen, all of Fed. Rep. of Germany, assignors to Bodenseewerk Perkin-Elmer GmbH, Uberlingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 304,993, Feb. 1, 1989. This application Jul. 6, 1989, Ser. No. 376,324

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1987, 3735013; Feb. 2, 1988, 3802968

Int. Cl.[5] G01N *21/74*

U.S. Cl. 356—312 12 Claims



1. An electrothermal atomization furnace assembly for atomizing sample for analysis by atomic absorption spectrophotometry comprising

a tubular furnace member adapted for passing a light beam therethrough and having a longitudinal bore and central furnace axis,

contact projections integrally formed longitudinally along said furnace member on opposite sides thereof so as to provide uniform current supply to the furnace member throughout the length thereof, said contact projections projecting outwardly from said furnace member and having distal ends,

contact surfaces on the distal ends of said contact projections adapted for supporting the furnace member between cooperating current-supplying contacts, and

said contact projections having a central axis transverse to said furnace member, each said contact projection having a contraction in cross-sectional area about said central axis between said distal end and said furnace member, said contraction being dimensioned and configured to reduce heat dissipation from said furnace member and to increase the relative temperature of said contraction during sample atomization.

4,961,646

MANUAL DEVICE FOR THE DETECTION OF OPTICAL REFLECTION PROPERTIES

Fortunat Schrämmli, Hausen; Markus Berner, Niederhasli, and Hans Ott, Regensdorf, all of Switzerland, assignors to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Jan. 24, 1989, Ser. No. 300,929

Claims priority, application Switzerland, Feb. 2, 1988, 361/88

Int. Cl.[5] G01J *3/18, 3/42;* G01N *21/27*

U.S. Cl. 356—328 26 Claims

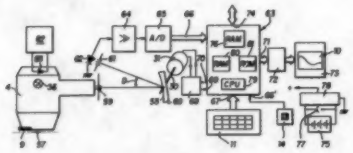
1. Manual device for the determination of optical reflection properties with a measuring head comprising:

a source of light;

optical illumination means to illuminate a measuring surface to be examined by the manual device;

optical measuring means to capture measuring light reflected by the measuring surface;

an optoelectronic layout exposed to the measuring light for converting optical signals into data that may be displayed by a display unit, said optoelectronic layout further including a device for spectrally decomposing the measuring light, equipped with a monochromator having a holographic concave reflection grating, together with a layout for detecting and evaluating the spectrum of the measuring light, wherein the grating for scanning of the spectrum is rotated around an axle extending at right angles to an inlet and outlet plane of the measuring light and wherein the spectrally decomposed light impacts a measuring light



photodetector, the axle of the grating being permanently, mechanically connected with a drive motor, which is additionally connected with a drive for displacement of the measuring head parallel to a standing surface of the manual device between a rest position and a measuring position.

4,961,647

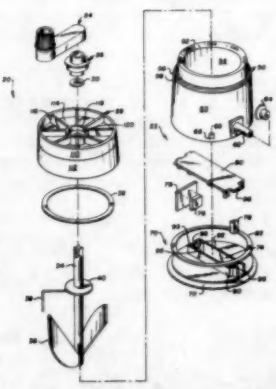
ORTHOPEDIC CEMENT MIXER

Garry D. Coutts, N. Syracuse, N.Y.; Eugene P. Lautenschlager, Skokie, Ill.; Richard L. Wixson, Evanston, Ill., and Michael A. Novak, Morton Grove, Ill., assignors to DHD Medical Products, Canastota, N.Y.

Continuation of Ser. No. 848,214, Apr. 4, 1986, abandoned. This application Sep. 12, 1988, Ser. No. 243,216

Int. Cl.[5] B01F *7/20*

U.S. Cl. 366—139 19 Claims



1. A device for mixing liquid and dry components and for removing entrapped air from within the dry component as well as vaporous and gaseous effluents from the admixed components during mixing to produce a substantially pore free material comprising:

a mixing-reaction vessel and a removable cover assembly for sealing said mixing-reaction vessel;

said mixing-reaction vessel including a reinforced, outer housing, a bottom closure and filter assembly, said outer housing having an inwardly extending upper edge from which an integrally formed mixing bowl depends, said mixing bowl being spaced inwardly from said outer housing thereby defining an evacuation chamber therebetween, said upper edge including means defining a plurality of spaced apart apertures to provide communication with said evacuation chamber, said outer housing includ-

ing an exhaust port to provide external communication through said filter assembly into said evacuation chamber and through said apertures;

a source of vacuum operatively connected to said mixing vessel;

said cover assembly including a cover for closing said mixing bowl, a mixing device operationally associated with said cover so as to extend downwardly into said mixing bowl, and sealing means for producing a seal between said cover and about said upper edge radially outwardly of said plurality of apertures;

said mixing device including a pair of oppositely angled mixing blades, each blade having solid, continuously extending flat exterior mixing surfaces and positioned at an angle ranging from about 30° to about 34° downwardly from vertical and having an exterior edge the major portion of which is shaped to substantially conform to the interior shape of the mixing bowl, said mixing blades combining to extend across substantially the entire interior dimension of the mixing bowl, said mixing device also including scraping means for scraping the upper portions of the mixing-reaction vessel, whereby rotation of the mixing device will produce mixing forces on the components which mix the components in a generally vertical direction and simultaneously establishes large exposed surfaces within said component mix as said mixing device is operated so that air entrained within the dry components and the mixture as well as other vaporous and gaseous pockets within the mixture are exposed and ruptured.

4,961,648

PULL-OUT GUIDE ASSEMBLY FOR DRAWERS OR THE LIKE

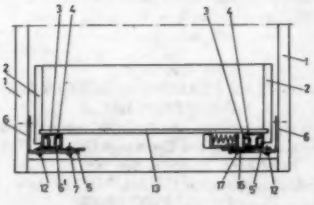
Erich Röck, Höchst, Austria, assignor to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Feb. 9, 1990, Ser. No. 477,765

Claims priority, application Austria, Feb. 22, 1989, A 400/89

Int. Cl.[5] F16C *29/00*

U.S. Cl. 384—19 **11 Claims**



1. A pull-out guide assembly for a drawer and comprising, on each side of the drawer:

a pull-out rail on the side of the drawer and a supporting rail on the side of a furniture body and load-transmitting rollers or slides,

in the longitudinal direction each said supporting rail being divided into a stop member fastenable to a furniture side wall and a running member, and

said running members being pivotally mounted on respective said stop members about respective vertical axles and acted upon by a spring, wherein said running members are guided parallel to each other and pivotable together in the same direction.

4,961,649

FINITE LINEAR MOTION ROLLING GUIDE UNIT

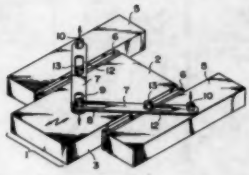
Tatsuo Mottate, Mitaka, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Aug. 14, 1989, Ser. No. 378,413

Claims priority, application Japan, Oct. 31, 1988, 63-140998[U]; Oct. 31, 1988, 63-140999[U]; Oct. 31, 1988, 63-272990[U]

Int. Cl.[5] F16C *29/04*

U.S. Cl. 384—49 **6 Claims**



1. A finite linear motion rolling guide unit comprising:

a track member (1) which has a horizontal vertex portion surface (2) and in which a cross sectional view has an almost square prism shape and track grooves (3') of balls are formed on both side surfaces;

a sliding member (4) whose cross sectional view has an almost inverse U-shape and which is constructed by a flat plate-shaped upper portion (4') and a pair of vertically depending track portions (5) having a similar shape which depend on both sides of said flat plate-shaped upper portion (4'), said sliding member (4) being arranged so as to ride over said track member (1) so as to be slidable in its axial direction;

a pair of ball assemblies (6) with holders in which track grooves (5') corresponding to said track grooves (3') of the track member (1) are formed on both inner side surfaces of said pair of vertically depending track portions (5) and which are arranged between the track grooves (5') of the vertically depending track portions (5) and the track grooves (3') of the track member (1), respectively; and

a link mechanism consisting of two or more arms for mutually pivotally coupling said track member (1), said sliding member (4), and said ball assemblies (6) and for restricting the motions in the sliding direction of the ball assemblies in said track grooves (3' and 5') upon relative sliding motions of the track member and the sliding member.

4,961,650

BALL CATCH FOR RELEASABLY RETAINING A GROOVED SHAFT

Jörg Schwarzbich, Meierfeld 14, D-4800 Bielefeld 1, Fed. Rep. of Germany

Filed Apr. 28, 1989, Ser. No. 344,375

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1988, 3814374

Int. Cl.[5] F16C *32/00*

U.S. Cl. 384—49 **26 Claims**

1. A ball catch for releasably retaining a grooved shaft, comprising:

a hollow bushing having an internal surface defining a front-to-rear extending longitudinal axis,

a guide part mounted in said bushing for axial movement, said guide part including a hollow skirt having an outer surface opposing said internal surface,

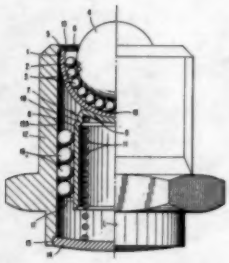
rolling elements disposed between said outer and internal surfaces to facilitate movement of said guide part,

a hemispherical socket seated on a front end of said guide part with its concave surface facing forwardly,

a locking ball disposed in said socket,

a plurality of small bearing balls disposed between said locking ball and said concave surface to facilitate rotation

of said locking ball, said bearing balls occupying less than the entire concave surface, and said concave surface including an indentation intersected by said axis, to facilitate displacement of said bearing balls along said concave surface, and



a compression spring disposed in said guide part for biasing said guide part forwardly,

said socket and said guide part comprising deep drawn sheet parts and being fixedly joined together.

4,961,651

CAGE FOR ROLLING BEARINGS

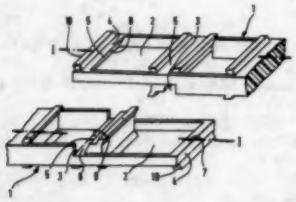
Jürgen Rabe, Auracht al, Fed. Rep. of Germany, assignor to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed May 8, 1989, Ser. No. 348,403

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1988, 3821037

Int. Cl.[5] F16C *29/04*

U.S. Cl. 384—51 **4 Claims**



1. A cage for rolling bearings comprising individual cage elements provided with rolling element pockets whereby the individual cage elements, at their ends in the region of at least one rolling element pocket have a reduced constructional height where they are placed on one another to overlap in the axial direction in the direction of movement of the rolling elements and are joined together in this region, wherein cut-outs and lugs are provided in the region of the reduced constructional height and engage with one another in a form fit when these regions are placed on one another and made to overlap, characterized in that both the cut-outs and the lugs extend across the entire width of the crossbars of the cage.

4,961,652

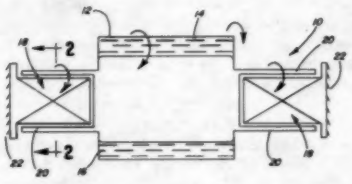
RADIAL BEARING

Richard M. Nallenweg, Cherry Valley, and Gerhardt E. Lichtfuss, Rockford, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 16, 1988, Ser. No. 169,228

Int. Cl.[5] F16C *17/03*

U.S. Cl. 384—312 **6 Claims**



1. A radial-type bearing for a centrifugal pump, comprising: means for saving space including

an outer drum-like member rotatable about a center axis and containing a fluid for pumping under centrifugal action in response to rotation of the drum-like member, the member having axial ends, an inner cylindrical bearing surface and an outer surface;

an inner shaft-like member within said portion of the rotatable drum-like member and being non-rotatable and generally coaxial with the outer rotatable member; and

a plurality of bearing pads having operative positions radially between the inner stationary member and the inner cylindrical bearing surface of the rotatable drum-like member, the bearing pads being pivotally mounted on the inner member for tilting movement in response to rotation of the drum-like member and having outer bearing surfaces complementary to the inner bearing surface of the rotatable drum-like member,

each said bearing pad residing radially within the outer surface of the drum-like member over that portion of each said bearing pad that is in axial coincidence with the drum-like member,

whereby said drum-like member, shaft-like member and bearing pads can be assembled into a system wherein the outer surface of the drum-like member is the radially outermost portion of said system between the axial ends of the drum-like member.

4,961,653

CROSSED ROLLER BEARING ASSEMBLY HAVING AN INSERTION HOLE

Osamu Suzuki, Yokohama, and Ichiro Masuda, Hyogo, both of Japan, assignors to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1989, Ser. No. 329,928

Claims priority, application Japan, Mar. 29, 1988, 63-73437

Int. Cl.[5] F16C *19/30*

U.S. Cl. 384—447 **4 Claims**

1. A crossed roller bearing assembly comprising:

an outer ring having an outer guide groove;

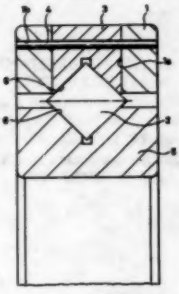
an inner ring having an inner guide groove, said inner ring being located inside of said outer ring with said inner guide groove located opposite to said outer guide groove to thereby define a guide space;

a plurality of rollers arranged in said guide space such that any two adjacent ones of said plurality of rollers are directed perpendicular to each other;

an insertion hole formed in at least one of said outer and inner rings and extending radially therethrough;

a plug for plugging said insertion hole when fit into said insertion hole, said plug having a shape substantially corresponding to that of said insertion hole so that no gap is

defined between said plug and said insertion hole when said plug is set in position inside of said insertion hole; and



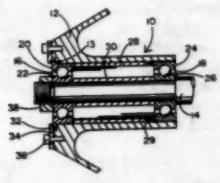
wherein said insertion hole is circular in cross sectional shape and has a diameter which is larger than a diameter of said rollers but smaller than a diagonal length in cross section of said rollers.

4,961,634

BEARING ASSEMBLY

Daniel W. Pangburn, Fullerton, and Gregg A. Cole, Chino, both of Calif., assignors to Aerojet-General Corporation, Folsom, Calif.

Filed Apr. 10, 1989, Ser. No. 335,467
Int. Cl.[5] F16C *19/52*
U.S. Cl. 384—517 **15 Claims**



1. A bearing assembly for maintaining the axial alignment of a rotating shaft; the assembly comprising:

a first bearing having opposed inner and outer annular races and a plurality of ball members therebetween;

a second bearing having opposed inner and outer annular races and a plurality of ball members therebetween;

said first and second bearings being positioned within a housing at axially spaced-apart positions along said shaft, said shaft extending through the inner races of said first and second bearings;

inner and outer annular sleeves positioned along said shaft between said first and second bearings, said inner sleeve being in contiguous engagement with said shaft and said outer sleeve being spaced radially from said inner sleeve;

said outer sleeve having at least one annular recess at an end thereof;

a compliant member positioned in said annular recess for applying a preselected minimum force between said outer race of said second bearing and said outer sleeve; and

means for clamping said outer race of said first bearing into compressive engagement with said outer sleeve for causing said outer sleeve to engage said outer race of said second bearing with a preselected maximum force initially obviating the effect of said compliant member;

whereby said force between said outer sleeve and said outer race of said second bearing is initially defined by said maximum force and, upon wear of said bearing assembly, is ultimately defined by said minimum force.

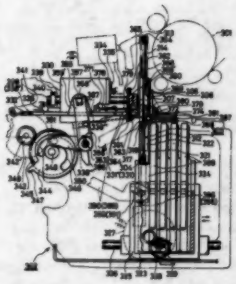
7. A bearing assembly comprising a pair of coaxially aligned spaced-apart ball bearing race members; means for initially applying a predetermined maximum preload force between said members; and means having a compliant member for providing a predetermined minimum preload force between said members upon subsequent wear of said members, said maximum preload force being determined by relative clamping of said members and said minimum preload force being determined by said compliant member only after said subsequent wear.

4,961,655

PRINTER WITH AUTOMATIC TYPE WHEEL EXCHANGING

Hideo Saito, Mitsukaido, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 896,056, Aug. 13, 1986, abandoned. This application Sep. 2, 1988, Ser. No. 240,445
Claims priority, application Japan, Aug. 14, 1985, 60-177754; Oct. 1, 1985, 60-216126
Int. Cl.[5] B41J *1/30*
U.S. Cl. 400—171 **15 Claims**



1. A printer of an automatic type wheel exchanging type, said printer having a platen for supporting one surface of a print sheet and carrying means guided so as to be reciprocated along said platen, said carrying means comprising:

a rotatable shaft;

drive means for detachably coupling said rotatable shaft to a rotational center of a type wheel having types in respective peripheral portions of a plurality of radially projected spokes and for exchanging the type wheel;

enclosing means for enclosing a plurality of type wheels;

attaching/detaching means for attaching a type wheel to said rotatable shaft and for detaching an attached type wheel at a detachable position;

moving means, including a motor and a rotary member which is rotated by the rotational force of said motor, for moving a type wheel in said enclosing means to the detachable position and for moving a type wheel located at the detachable position into the enclosing means, said attaching/detaching means and said moving means respectively made operative within one rotation of said rotary member, and said rotary member includes means for operating said moving means and thereafter said attaching/detaching means when said rotary member forwardly rotates and for operating said attaching/detaching means and thereafter said moving means when the rotary member rotates in reverse;

a hammer for pressing the type of a type wheel coupled to said rotatable shaft onto the print sheet; and

type wheel exchanging means for exchanging a first type wheel coupled to said rotatable shaft by releasing the

rotational center of the first said first type wheel from said rotatable shaft and engaging the rotational center of a second type wheel from said enclosing means with said rotatable shaft, and for returning the first type wheel to said enclosing means by said drive means.

4,961,656

ENDLESS LOOP RIBBON CASSETTE WITH ORDERED STORAGE

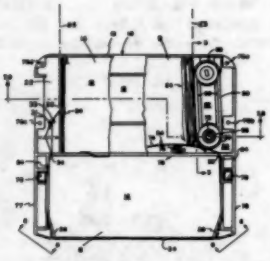
Tyrone N. Surti, 424 Harding Industrial Dr., Nashville, Tenn. 37211

Continuation of Ser. No. 101,569, Sep. 25, 1987, Pat. No. 4,826,334. This application Jan. 26, 1989, Ser. No. 303,096

The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.

Int. Cl.[5] B41J *32/02*

U.S. Cl. 400—196.1 **4 Claims**



1. A reelless printing ribbon cassette for a printer having a rotary drive member and comprising:

a body having a substantially rectangular cavity therein, said cavity including first and second horizontally spaced horizontal sections disposed at different elevations and an intermediate section extending in obliquely angled relation between said horizontal sections, said sections being linearly arranged with each end of said intermediate section abutting a said horizontal section, said intermediate section serving as a storage compartment for containing said ribbon, said cavity being defined by a cover and base of said body, said first horizontal section being formed by generally parallel horizontal internal surfaces of said cover and said base, said first horizontal section being disposed adjacent to a first side of said body, said second horizontal section being formed by generally parallel internal horizontal surfaces of said cover and said base, said second horizontal section being disposed adjacent to a second side of said body, said intermediate connecting angled section being formed by generally parallel intermediate internal surfaces of said cover and said base, said generally parallel intermediate surfaces disposed at an oblique angle to the line of printing of said printer and said horizontal surfaces;

an entrance opening in said first horizontal section of said cavity through which said ribbon enters said cavity;

a second opening in communication with said second horizontal section of said cavity and said angled section of said cavity through which said ribbon exits said storage compartment; and

ribbon drive means connectable to said rotary drive and disposed in normal relation to a line of printing, said drive means supported in said first horizontal section of said cavity and including a drive shaft in alignment with said rotary drive member for rotation thereby for driving said ribbon linearly into and out of said cavity and for driving said ribbon past said line of printing, said ribbon drive means including a pair of drive assemblies supported by said first horizontal surface of said cover of said cassette, said drive assemblies including rotary members for guiding said ribbon therebetween into said cavity, one of said drive assemblies including a drive shaft for mating aligned relation with said rotary drive member of said printer.

4,961,657

RECORD MEDIA DRIVE MECHANISM FOR DOT MATRIX PRINTER

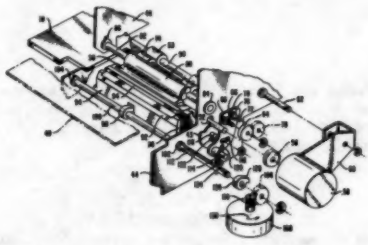
Toshihiro Jingu, Hiratsuka, and Masao Kusayanagi, Odawara, both of Japan, assignors to NCR Corporation, Dayton, Ohio

Filed Jul. 24, 1989, Ser. No. 384,204

Claims priority, application Japan, Sep. 16, 1988, 63-230163

Int. Cl.[5] B41J *11/54*

U.S. Cl. 400—599 **20 Claims**



1. A drive mechanism for record media comprising a

first feed roller carried on a first shaft having a first gear at one end thereof, a

second feed roller carried on a second shaft having a second gear at one end thereof, an

intermediate gear positioned to mesh with said first gear and with said second gear, an

arm pivotally supported on said second shaft and biased in one direction, said intermediate gear being journaled on said arm at one end thereof and said arm having a stud at the other end thereof,

means for driving said first feed roller for advancing said record media,

means for moving said first feed roller to provide a path for said record media,

cam means operably associated with said arm to rotate therewith and having a cam surface engaging with said first shaft, and

means operably associated with said means for moving said first feed roller and engageable with said stud on said arm for limiting the rotation of said arm and the movement of said first feed roller.

4,961,658

FEED ROLLER RELEASE DUE TO CARRIAGE MOVEMENT IN A PRINTING APPARATUS

Kazuhiko Takagi, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jun. 14, 1988, Ser. No. 206,315

Claims priority, application Japan, Jun. 15, 1987, 62-92599[U]; Jun. 15, 1987, 62-92600[U]

Int. Cl.[5] B41J *13/03*

U.S. Cl. 400—636.1 **13 Claims**

1. A printer comprising:

a frame;

a platen for supporting printing paper;

a carriage reciprocally movable along said platen and having a print head mounted thereon, said platen, said carriage, and said print head defining a printing portion;

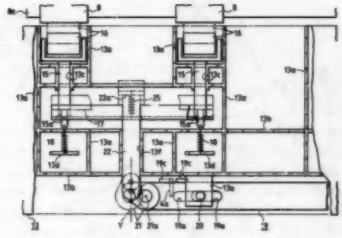
paper feed means for feeding said printing paper through said printing portion, said paper feed means including a first paper supply roller disposed on the upstream side of

said printing portion and a second paper supply roller disposed on the downstream side of said printing portion;

at least one back-up roller disposed at an upstream side of said printing portion and rotationally abutted against said paper feed means;

at least one discharge roller disposed at a downstream side of said printing portion and movable toward and away from said paper feed means; and

discharge roller driving means for moving said discharge roller toward and away from said paper feed means, said discharge roller driving means moving said at least one discharge roller toward said paper feed means for nipping said printing paper therebetween prior to the release of a tail edge of said printing paper from between said at least one back-up roller and said paper feed means;



operation means disposed in parallel with said platen and having a first end portion and a second end portion, each said portion being engageable with said carriage, said operation means for moving said discharge roller toward and away from said paper feed means;

a linking member connected to said operation means; and

a movable portion connected between linking member and said discharge roller;

wherein said carriage is movable between leftmost and rightmost positions, said carriage being engageable with said first end portion of said operation means at said leftmost position and being engageable with said second end portion of said operation means at said rightmost position.

4,961,659

PRINTER CASE

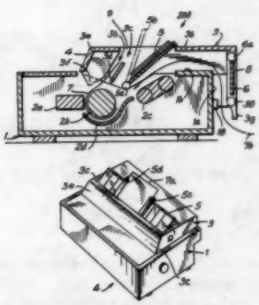
Hitoshi Igarashi, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Jan. 24, 1989, Ser. No. 301,071

Claims priority, application Japan, Jan. 26, 1988, 63-14821; Jan. 26, 1988, 63-14829

Int. Cl.[5] B41J *29/02*

U.S. Cl. 400—693 **17 Claims**



1. A printer case for a printer having printer components adapted to print on individual sheets of paper and fan-fold computer paper, comprising a bottom case supporting said printer components therein, a cover having a sheet guide pivotably supported thereon, said sheet guide being pivotable between a first position for guiding individual sheets into said printer and a second position for guiding fan-fold paper out of said printer after printing has occurred thereon, and coupling means for pivotably coupling said cover to said bottom case between a first position where said cover is closed to permit printing to occur and a second position where said cover is open to expose said printer components and to permit insertion of said fan-fold paper, said cover being formed with a rear opening and further comprising a mounting axis mounted within said opening and a rear cover flap rotatably supported about said mounting axis to close said rear opening when said cover is closed.

4,961,660

METHOD FOR CORRECTING MISTYPES IN AN ELECTRIC TYPEWRITER

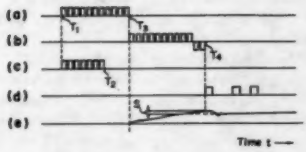
Hiroji Iwai, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 28, 1988, Ser. No. 291,215

Claims priority, application Japan, Dec. 28, 1987, 62-334595

Int. Cl.[5] B41J *35/20*

U.S. Cl. 400—697.1 **5 Claims**



1. A method for correcting mistypes by an electric typewriter comprising steps of:

moving a carriage to a position corresponding to a printed character to be erased;

rotating a printing wheel so as to position a printing type, corresponding to said printer character to be erased, at said carriage position;

outputting first and second ready signals upon completion of said moving step and rotating step, respectively;

shifting a correction tape so as to position an unused portion thereof to a position in front of the printed character to be erased in response to said outputted first and second ready signals;

outputting a third ready signal subsequent to said shifting step, said output of said third ready signal corresponding to said correction tape oscillating and reaching a predetermined maximum height; and

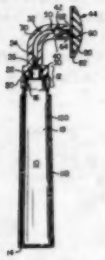
striking said printing type of said printing wheel, with a hammer, a plurality of times such that said correction tape strikes said character to be erased, said hammer initially striking said printing type in response to the third signal being outputted when said correction tape is at its predetermined maximum height and said hammer subsequently striking said printing type a predetermined time period after said third ready signal when said correction tape has stopped oscillating and is in a static state lower than said predetermined maximum height and positioned directly over said printed character.

4,961,661

EXTENDABLE FLUID APPLICATOR

Terry J. Sutton, and Debra S. Sutton, both of 1349 Meadow Creek Clr., #186, Irving, Tex. 75038

Filed Sep. 5, 1986, Ser. No. 904,347
Int. Cl.[5] A45D *34/00*; A47L *13/16*
U.S. Cl. 401—6 4 Claims



1. A fluid applicator comprising a tubular vessel having first and second ends, an elongate axis and a wall extending between said first and second ends, wherein said first end further comprises a port through which a fluid may pass from the interior of said tubular vessel;

said wall having a smooth exterior surface sufficiently flexible to allow the volume of said tubular vessel to be decreased by the application of an external force to said wall to cause the fluid located in said tubular vessel to be extruded through said port, and said wall being biased to return to a position having a substantially circular cross section when said force is removed;

further comprising a tubular sleeve having an elongate axis and first and second ends, which axis is substantially concentric with the elongate axis of said tubular vessel, wherein the inner diameter of said tubular sleeve is sized to slidably engage with the outer diameter of said wall of said tubular vessel and said tubular sleeve is mounted about said tubular vessel in a first position, wherein said tubular sleeve's first end is proximate said tubular vessel's first end and said tubular sleeve's second end is proximate said tubular vessel's second end, and has a second position wherein said tubular sleeve's first end is proximate said tubular vessel's second end and said tubular sleeve's second end is extended from said tubular vessel's second end; and

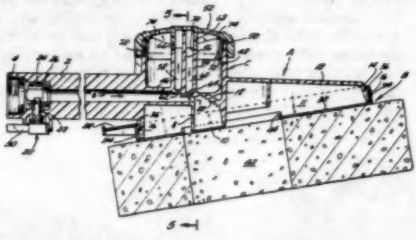
the tubular vessel being tapered with the diameter of the tubular vessel larger at its second end than at its first end, and the tubular sleeve being tapered with the diameter of the tubular sleeve larger at its second end than at its first end, with the exterior diameter of the second end of said tubular vessel larger than the internal diameter of the first end of the tubular sleeve so that the first end of the tubular sleeve is prohibited from passing over the second end of the tubular vessel to avoid disengagement of the tubular sleeve from the tubular vessel, and so that the tubular sleeve can be frictionally wedged against the tubular vessel with the first end of the tubular sleeve proximate the second end of the tubular vessel to secure the said tubular sleeve in an extended position.

4,961,662

FOUNTAIN BRUSH ASSEMBLY

Ho Chow, Cliffside Park, and Sidney J. Goodman, Paramus, both of N.J., assignors to Hunter-Melnor, Inc., Memphis, Tenn.

Filed May 23, 1988, Ser. No. 197,286
Int. Cl.[5] A46B *11/02*, *11/06*; A47L *13/17*
U.S. Cl. 401—42 5 Claims



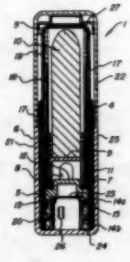
1. In a fountain brush assembly comprising a carrier and a brush head mounted thereon, said carrier comprising a housing and including fluid conduit means communicating between the exterior of said housing and an exit portion operatively related to said brush head, a detergent reservoir on said carrier, said conduit means adjacent said reservoir comprising walls defining upstream and downstream portions of decreasing size with openings in said walls at said upstream and downstream portions respectively, said reservoir comprising a fluid flow tube partitioned into two passages communicating respectively with said openings and having exit openings communicating with said reservoir, said reservoir having a cover movable between detergent-filling, detergent-flow and detergent-blocking positions, and control means carried by said cover and movable into and out of operative engagement with said exit openings to prevent fluid flow therethrough from said conduit means through said reservoir and back to said conduit means when said cover is in its detergent-blocking position, to permit such fluid flow when said cover is in its said detergent-flow position, and to open said reservoir to outside access for detergent filling when in said detergent-filling position.

4,961,663

CARTRIDGE TYPE COSMETIC BAR CONTAINER

Yoichi Iwamoto, Chiba, and Hisao Iwamoto, Kanagawa, both of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Nov. 13, 1989, Ser. No. 434,753
Int. Cl.[5] A45D *40/06*
U.S. Cl. 401—78 3 Claims



1. A cartridge type cosmetic bar container which comprises a cartridge comprising a bottomed inner cylinder with a peripheral wall having an axially extending elongated slot, an outer cylinder with an inner circumferential wall having a spiral groove and fitted rotatably around the outer periphery of said inner cylinder, and a payout cylinder having a periph-

eral projection and rotatably mounted in said inner cylinder with said projection extending through said elongated slot of said inner cylinder and engaging said spiral groove of said outer cylinder and a bottomed rotary operating cylinder adapted to removably accommodate said cartridge, said rotary operating cylinder having a cylindrical elevation at its inner bottom, said inner cylinder of said cartridge having a recess complementary to said cylindrical elevation for engagement at its outer bottom, said cylindrical elevation having a plurality of raised parts at circumferentially spaced intervals on its outer periphery for pressure contact with the inner circumferential surface of said recess, and said inner cylinder being circumferentially provided with linear resilient members on its outer periphery for contact with the inner circumferential surface of said outer cylinder.

4,961,664

NAIL POLISH CONTAINER HAVING A MOVEABLE BRUSH

Joyce Simper, 4733 Durango Dr., Buena Park, Calif. 90621

Filed Jul. 13, 1989, Ser. No. 379,216

Int. Cl.[5] A46B *11/00*

U.S. Cl. 401—127 **1 Claim**

1. A container for nail polish comprising:

(A) a body for containing nail polish therein and having a neck portion with external threads on one end and a bottom on another portion; and

(B) a hollow cap unit for closing the body and which includes

(1) a cylindrical neck engaging portion on one end of said cap unit, said neck engaging portion having internal threads which co-operate with said body external threads,

(2) a frusto-conical side wall exending from said neck engaging portion with said neck engaging portion being located at a base section of said frusto-conical side wall,

(3) a circular top wall on said side wall on another end of said cap unit, said circular top wall having a diameter which is smaller than the cylindrical neck engaging portion, said side wall converging from said neck engaging portion to said top wall, said circular top wall having a top surface and a bottom surface and having a circular bore defined therethrough with said circular bore having a center which is located on the center of said circular top wall,

(4) a circular base wall connected to said side wall adjacent to said base section, said base wall closing said cap unit base section, a combination of said side wall said top wall and said base wall cooperating to define an interior volume of said hollow cap unit, said top wall bottom surface being located inside said interior volume and said top wall top surface being located outside said interior volume, said cap unit circular base wall having a circular bore defined therethrough, said base wall circular bore having the center thereof located on the center of the base wall and in alignment with the center of said top wall circular bore center,

(5) a hollow cylindrical button having a circular top end and a circular bottom end, with said button circular top and bottom ends having diameters which are equal to each other, said button further including a cylindrical side wall connecting said button top and bottom ends and which has an outer diameter which is essentially equal to the diameter of said top wall circular bore and which frictionally engages the top wall adjacent to said circular top wall bore and being slidably movable on said top wall to move towards and away from said body bottom when said cap unit is mounted on said body, said button having a length measured between said button top end and said button bottom end,

(6) a brush applicator unit attached to said button and extending toward said body bottom when said cap unit is mounted on said body, said brush unit having

(a) a stem attached at one end thereof to said button bottom end and extending through the bore defined through said base wall,

(b) a bristle unit attached at another end of said stem to be located adjacent to said body bottom when said cap unit is mounted on said body,

(c) a return spring mounted on said stem,

(d) a spring seat on said stem, said spring seat being spaced from said button bottom end and located within said interior volume,

(e) said return spring having one end thereof seated against said spring seat and another end thereof seated against said base wall adjacent to the bore defined through said base wall and biasing said stem away from said body bottom;

(C) a stop means on said cap unit which holds said button in a first position with said bristle unit spaced from said body bottom when said cap unit is mounted on said body and said button is in a retracted position, and which holds said bristle unit in a forward position in contact with said body bottom when said button is forced towards said base wall, said stop means including

(1) a circular button hole defined through said cylindrical button side wall, said button hole being located approximately midway between said button top end and said button bottom end and being sized so that at least about one-fourth of the button length is located between said button hole and said button top end,

(2) a spring having one end thereof engaged against said button side wall, said stop means spring being located inside said button adjacent to said button hole,

(3) a spherical ball mounted on said stop means spring and being forced against said button side wall adjacent to said button hole, said spherical ball having an outer diameter which is greater than the diameter of said circular button hole and having a portion thereof extending outwards beyond said button side wall when forced against said button side wall by said stop means spring, said ball portion engaging said top wall top surface to hold said bristle unit in said retracted position and engaging said top wall bottom surface inside said interior volume to hold said bristle unit in said forward position, and

(4) a grasping means on said button, said grasping means including the portion of said button located between said button hole and said button top end when said bristle unit is in said forward position, said grasping means being used to pull said button from said forward position to said retracted position.

4,961,665

MASCARA APPLICATOR

Holger Fitjer, Lambrechtstrasse 15, D-8800 Ansbach, Fed. Rep. of Germany

Filed Aug. 4, 1989, Ser. No. 389,707

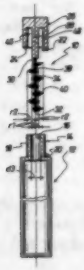
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1988, 8810416

Int. Cl.[5] A46B *11/00*; A45D *34/04*

U.S. Cl. 401—129 **9 Claims**

1. A mascara applicator including: a mascara brush compris-

ing a stem portion, an elongate fixing element connected to the stem portion, and bristles which are carried on the fixing element and which extend along the fixing element with the bristle tips forming first and second helical lines which are displaced through 180° of angle relative to each other, the tips of the bristles along said first helical line defining a first brush diameter and the tips of the bristles along said second helical



line forming a second brush diameter which is smaller than the first brush diameter; and a container for mascara, having an opening for insertion of the mascara brush into the container, wherein the first brush diameter defined by bristles of the mascara brush is larger than the diameter of the opening of the mascara container and the second brush diameter defined by bristles of the mascara brush is at most equal to the diameter of the opening of the mascara container.

4,961,666

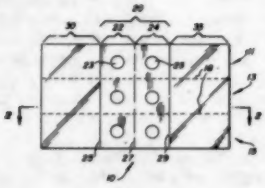
BINDING TABS

Warren R. Pitts, Needham; Barbara J. Burns, Auburn, and Ralph J. Shuman, Needham, all of Mass., assignors to Dennison manufacturing Company, Framingham, Mass.

Filed Apr. 12, 1989, Ser. No. 336,839

Int. Cl.[5] B42F *13/00*

U.S. Cl. 402—79 **9 Claims**



1. A tab for binding articles in looseleaf binders, comprising an elongate foldable flat strip which is bilaterally symmetric around a central fold line, said tab having two apertured portions having respective discrete apertures on opposite sides of the central fold line, and first and second wing portions at the opposite ends of said elongate tab, wherein one face of the strip is coated with pressure sensitive adhesive and can be folded along the fold line and its apertured portions adhesively secured to each other with their apertures aligned, whereupon the wing portions can be adhesively secured to the article; said adhesive coated strip being releasably adhered to a carrier sheet which is divided into separately removable portions respectively adhered to the apertured portions and wing portions of the tab.

4,961,667

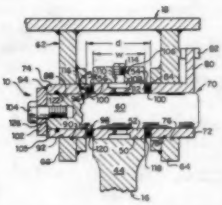
PIVOT JOINT FOR LOADER LINKAGES AND THE LIKE

Harold L. Reinsma, Dunlap, and W. Stanley Born, Edelstein, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Sep. 5, 1989, Ser. No. 402,369

Int. Cl.[5] F16C *11/02*

U.S. Cl. 403—11 **17 Claims**



1. A pivot joint for pivotally connecting a first member of a loader mechanism to a second member thereof, comprising:

said first member having a pin end of predetermined width;

a pin pivotally received through said pin end of the first member;

said second member having a pair of brackets, said brackets being spaced laterally apart an enlarged distance sufficiently greater than the width of the pin end of said first member so as to permit a predetermined amount of axial shifting of said first member between said brackets; and

means for mounting the opposite ends of said pin to said brackets with the pin end being locatable at any axial position between said brackets and for constraining the axial movement of said pin end at any such axial position so as to prevent any significant end-play movement therebetween, said mounting means including a pair of end collars, a first of said end collars being fixedly secured to one end of said pin and slidably mounted to a first of said brackets and a second of said end collars being sized to be slidably mounted on the other end of the pin and fixedly secured to a second of said brackets at a preselected axial position based upon said any such axial position of the pin end of said first member.

4,961,668

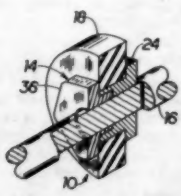
QUICK-RELEASE HUB ASSEMBLY FOR MOUNTING A WHEEL ELEMENT TO A SHAFT

Hugh M. Trautmann, Renfrew, Pa., assignor to Billco Manufacturing, Inc., Zelienople, Pa.

Filed Oct. 30, 1989, Ser. No. 429,196

Int. Cl.[5] F16B *2/02*; F16D *1/00*

U.S. Cl. 403—351 **9 Claims**



1. A hub assembly, for releasably securing a resilient wheel element on a rotatable shaft, comprising:

first and second hub members for slidable mounting to an operative position on the shaft;

each hub member having a tubular body with a bore defined by an inner annular surface concentric with the bore's axis

and an inside diameter enabling the hub member to be snugly fitted on the shaft;

the tubular body of the first hub member having an outer annular surface which is eccentric to the axis of its central bore;

the tubular body of the second hub member having an outer annular wheel element supporting surface concentric to its bore axis and an eccentric bore portion for insertably receiving the tubular body portion of the first hub member therein in a snug interfitting relationship such that limited rotation of one hub member relative to the other causes a binding action between the hub members and between each hub member and the shaft, and counterrotation of the members releases the binding action; and

the wheel element having a central opening defining an inner annular surface in snug registration on the wheel element supporting surface such that the binding and releasing actions between the hub members can be accomplished by manually gripping the wheel element to thereby control the rotation of the second hub member.

4,961,669

SPLINE CONNECTION

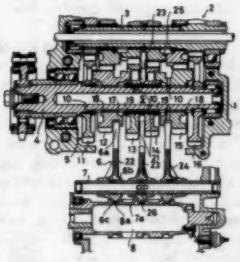
Kazuhito Itoh, Wako; Katsumi Fujimoto, Niiza, and Kouji Kuroda, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1989, Ser. No. 304,451

Claims priority, application Japan, Feb. 5, 1988, 63-24024

Int. Cl.[5] F16N *7/36*

U.S. Cl. 403—359 **8 Claims**



1. A spline connection, comprising a spline boss having inward spline teeth with a recess located between said inward spline teeth having inside surfaces; and a spline shaft slidably engaged with said spline boss and having outward spline teeth with outside surfaces, wherein a header passage for a lubricant is formed along a core of said spline shaft and oil passages are further formed in said spline shaft so as to radially pierce therethrough from said header passage, wherein at least one of said outward spline teeth of said spline shaft is provided at a top portion thereof with a groove crossing transversely said top portion of said outward spline tooth so as to have an open end of said oil passage disposed in said groove to thereby assure the uniform supply of lubricant to said spline connection, said recess inside surfaces located radially outward of said groove along an axis through the center of said spline shaft.

4,961,670

MOLDED SEPTIC TANK

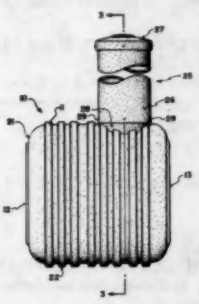
Kenneth M. McKenzie; Wayne R. Anderson, and Lorne Abrams, all of Winnipeg, Canada, assignors to Bonar Inc., Burlington, Canada

Filed Mar. 27, 1989, Ser. No. 329,266

Int. Cl.[5] B65D *6/38*

U.S. Cl. 405—53 **19 Claims**

1. A tank for containing liquid materials comprising a plurality of tank modules, each module being separately molded from a plastics material to define a hollow substantially closed integrally molded container defined by a pair of spaced end walls transverse to a horizontal axis of the container and a peripheral wall having an upper wall portion and a base wall portion and substantially surrounding said axis, the end walls being integrally molded with the wall portions so that the peripheral wall is connected to the end walls such that the end walls extend as a transverse support across the wall portions of the peripheral wall to act as a structural support therefor, a connecting one of the pair of end walls of one tank module being connected to a connecting one of the pair of end walls of



a next adjacent tank module, each one of the connecting end walls having a part thereof shaped so as to cooperate with a part of the other of the connecting walls in a contacting relationship, a plurality of clamping members, each clamping member passing through the contacting parts of the end walls at a position thereon spaced from the other clamping members so as to hold said end walls clamped together in said contacting relationship, and means defining cooperating openings in said contacting parts allowing communication of said liquid materials from said one tank module to said next adjacent tank module.

4,961,671

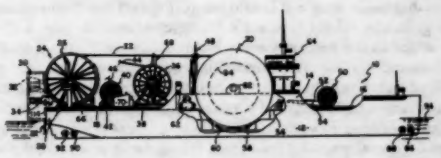
METHOD OF CONVERTING A PIPELINE LAYING VESSEL FROM A PIVOTAL RAMP TYPE TO AN ARCUATE TYPE

Carlos E. Recalde, Irvine, Calif., assignor to Santa Fe International Corporation, Alhambra, Calif.

Continuation of Ser. No. 268,238, Nov. 7, 1988, abandoned, which is a division of Ser. No. 48,454, May 11, 1987, abandoned, which is a continuation of Ser. No. 757,790, Jul. 22, 1985, abandoned, and a continuation-in-part of Ser. No. 646,112, Aug. 31, 1984, abandoned. This application Feb. 26, 1990, Ser. No. 484,479

Int. Cl.[5] F16L *1/04;* **B63B** *35/04*

U.S. Cl. 405—168 **2 Claims**



1. A method of converting a single pipeline laying vessel having a main storage reel and a separate spaced pivotal ramp pipe straightening and tensioning assembly to a vessel having the main storage reel and a separte spaced pipelline laying device adapted for being mounted adjacent the stern of the vessel downstream of the main storage reel in the direction of

unspooling and wherein the pipeline laying device includes a single pipe take-off drum for rottaion about a horizontal drum axis, with the surface of the drum providing continuous contact with the pipeline so that the drum and pipeline move simultaneously at the same angular velocity as the drum rotates;

said method comprisng the steps of:

removing the pivotal ramp pipe straightening and tensioning assembly from the deck of the vessel;

installing the drum with pipe take-off structure adjacent the stern of the vessel and spaced from the main storage reel, the surface of the drum providing moving contact for the pipeline to permit adjustment of the water entry angle of the pipeline;

rotating the pipe take-off structure and drum about the same axis of rotation; and

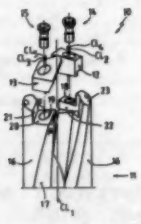
providing the main storage reel with motive power means having both spooling direction power and unspooling direction braking systems.

4,961,672

DRILL AND CUTTING INSERT THEREFOR

Hans E. Lindberg, Sandviken, Sweden, assignor to Sandvik AB, Sandviken, Sweden

Filed Jul. 1, 1988, Ser. No. 214,402
Claims priority, application Sweden, Jul. 2, 1987, 8702726-4
Int. Cl.[5] B23B *51/02*
U.S. Cl. 408—144 **16 Claims**



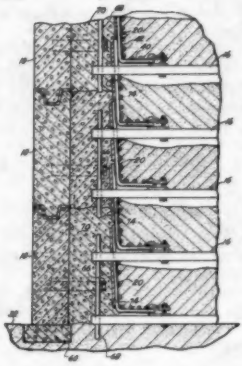
1. A drill comprising a shank defining a longitudinal center axis, said shank having longitudinal lands, longitudinal chip flutes between said lands, and at least one insert site disposed at a front axial end of said shank, said insert site comprising a generally axially forwardly facing surface having a first hole therein, a generally tangentially disposed surface extending axially from said generally axially forwardly facing surface, and a generally radially disposed surface extending generally axially from said generally axially forwardly facing surface, a cutting insert mounted in said insert site, said insert comprising a generally axially forwardly facing clearance surface, a chip surface facing generally away from said generally tangentially disposed surface and intersecting said clearance surface to form a cutting edge therewith, a side surface facing said generally tangentially disposed surface, and a generally axially rearwardly facing lower surface including a first portion abutting said generally axially forwardly facing surface, a second portion offset axially relative to said first portion, and a step surface interconnecting said first and second portions and facing said generally radially disposed surface, a second hole extending through said insert from said clearance surface to said first portion of said lower surface, and a tightening member extending through said second hole and received in said first hole for securing said insert to said insert site.

4,961,673

RETAINING WALL CONSTRUCTION AND METHOD FOR CONSTRUCTION OF SUCH A RETAINING WALL

Michael A. Pagano, Marietta, Ga., and Longine J. Wojciechowski, Potomac, Md., assignors to The Reinforced Earth Company, Arlington, Va.

Continuation-in-part of Ser. No. 126,276, Nov. 30, 1987, abandoned. This application Feb. 14, 1989, Ser. No. 311,147
Int. Cl.[5] E02D *29/02*
U.S. Cl. 405—287 **29 Claims**



1. An improved retaining wall construction comprising, in combination:

(a) a granular, compactable fill defining a three dimensional earthenwork bulk form having a generally planar front face extending upwardly from a datum plane;

(b) said earthenwork bulk form including a plurality of tensile members dispersed within the bulk form and extending in a generally horizontal straight line array through the bulk form and projecting beyond the front face into a region forward of the front face, sets of said tensile members defining generally spaced horizontal planes of elevation through the bulk form, said tensile members at least in part frictionally engaging the fill;

(c) said earthenwork bulk form also including a plurality of gridforms, each gridform including a first run extending from the front face of the bulk form partially into the bulk form along a horizontal plane of elevation and connected to at least some of the tensile members at an elevation, each gridform also including a second run along the generally planar front face joined to the horizontal first run; said second run extending upwardly from the first run; said second runs of said gridforms forming a pattern of grid material defining the planar front face of the bulk form;

(d) a plurality of separate preformed panels defining a complete wall surface generally parallel to and spaced outwardly from the planar front face of the bulk form, to define the region, each of said panels including a front side and a back side, and reinforcing means integral with each panel and extending into the region, said panels being stacked one on top of the other and side by side to form the complete wall with a complete front side;

(e) means connecting the panel reinforcing means to select tensile members in the region; and

(f) cast colloidal means in the region filling the space between the back side of the panels and the front face, said cast colloidal means enveloping the connected reinforcing means and tensile means within the region, said cast colloidal means formed as separate layers one atop the other from the bottom to the top of the wall, each layer having a height no greater than the height of an integral number of panels, whereby the panels and the front face of the

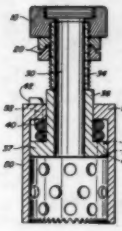
bulk form define the area for the cast colloidal means; said tensile means and gridforms being generally independently deformable relative to the panels and cast colloidal means, whereby consolidation of the bulk form will minimally stress or distort the panels and cast colloidal means.

4,961,674

DRILL GUIDE FOR PRECISE DRILLING

Edward A. Wang, 370 A 2nd Ave., San Francisco, Calif. 94118, and George M. Kung, 125 Manor Dr., San Francisco, Calif. 94127

Filed Jul. 21, 1989, Ser. No. 384,172
Int. Cl.[5] B23B *49/00*
U.S. Cl. 408—14 **2 Claims**



1. A drill guiding instrument for use with a drill, which includes means for securing said drill guide to said drill, the said drill guide comprising

a. an elongated hollow shaft having a threaded portion, a not threaded portion, and a graduated scale which is carved longitudinally on a portion of said threaded and not threaded surfaces,

b. said not threaded portion of said shaft having an outwardly extended shoulder and a hole within said outwardly extended shoulder,

c. a housing having an inwardly extended shoulder which is telescopically mounted and encircling over said shaft, and said housing has a hole through said inwardly extended houlder,

d. a stretchable means which is secured between said housing and said shaft through said holes of said shoulders of said shaft and said housing,

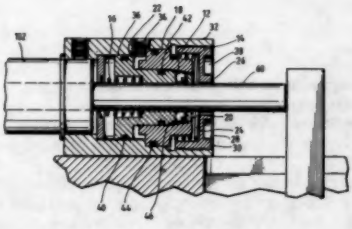
e. a drill depth limiting means mounted on the said threaded portion of said shaft.

4,961,675

ADJUSTABLE SET BACK CONTROL DEVICE

John F. Stewart, Lexington, S.C., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Oct. 28, 1987, Ser. No. 113,588
Int. Cl.[5] B23B *47/22*
U.S. Cl. 408—1 R **13 Claims**



1. An adjustable set back control device for an airfeed peck drill whose drill travel speed is controlled with a damping cylinder having a movable piston rod, said adjustable set-back control device comprising;

a plurality of ball members positioned to surround and restrict the axial movement of the movable piston rod;

a first member for axially positioning said ball members with respect to the movable piston rod;

a second member for radially positioning said ball members with respect to the movable piston rod;

a hydraulic positioning means for selectively positioning said first member relative said second member; and

a hydraulic actuation means for actuating said hydraulic positioning means;

so that the travel of the movable piston rod with respect to the clamping cylinder is limited.

13. A method for adjustably controlling the position of a piston rod which controls the position of an airfeed peck drill, said method comprising the steps of:

surrounding the piston rod with a plurality of ball members;

controlling the axial position of said ball members with respect to the piston rod;

controlling the radial position of said ball members with respect to the piston rod;

biasing said ball members into contact with the piston rod so as to restrict the travel of the piston rod;

using the application of air pressure to cause said biasing of the ball members out of contact with the piston rod;

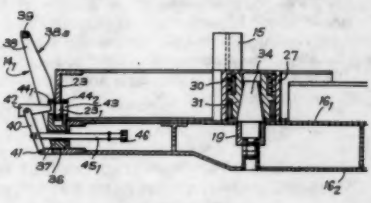
using an adjustable nut to limit the axial travel of said ball members with respect to the piston rod so that the length of travel of the piston rod may be selectively limited.

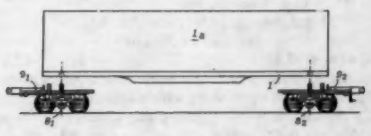
4,961,676

GOODS TRANSPORT SYSTEMS WHICH ARE TRANSFORMABLE INTO RAIL VEHICLES, AND RAIL BOGIES FOR USE THEREWITH

Jean-Paul Gourdin, La Seyne sur Mer, France, assignor to Intermotra, Toulon Cedex, France

Filed Nov. 29, 1988, Ser. No. 277,285
Claims priority, application France, Dec. 11, 1987, 87 17535; Oct. 28, 1988, 88 14480
Int. Cl.[5] B61F *5/04*
U.S. Cl. 410—53 **15 Claims**





15. A rail vehicle including a goods transport system having a deck and a raiseable road axle assembly extending from the deck connectable to a rail bogie, said bogie including axles provided with rail wheels, a central pivot, and an intermediate chassis which is fixed to said central pivots and which carries members for coupling to another rail vehicle, wherein said intermediate chassis includes a pair of vertical conical pegs which taper upwardly and which project above a top face of

said chassis, which pegs are intended to engage cylindro-conical bushes carried by said deck by means of a resilient member whose dimensions and whose stiffness are designed so that the load of the deck compresses said resilient member sufficiently for the deck to bear directly against the top face of the intermediate chassis when the conical pegs carried by said intermediate chassis are engaged in said hollow bushes, said chassis also including lateral guide ramps, sloping down inwardly, situated on the sides of the chassis and at least one longitudinal guide ramp fixed on a cross-bar of said chassis.

4,961,677

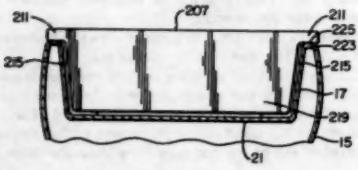
TRUCK BED BULKHEAD

Marvin L. Downard, Jr., 8045 Broad St., Box 154, Thurston, Ohio 43157

Continuation of Ser. No. 219,213, Jul. 15, 1988, abandoned. This application Jan. 25, 1990, Ser. No. 470,430

Int. Cl.[5] B60P *7/14*

U.S. Cl. 410—129 **8 Claims**



1. In a pickup truck of the type comprising a cargo bed, enclosing cargo bed opposing sidewalls, and wheel well cover means within the cargo bed, an improved partitioned cargo bed wherein the partitioning comprises a vertical wall and hanger means, the wall comprising a single vertical rigid wall spanning between opposing truck bed sidewalls to separate two adjacent portions of the truck bed, the sizes of which can be variably selected by the longitudinal positioning of the wall on the truck bed sidewalls, and suspended in unattached contact on the sidewalls' top edges by hanger means, and the hanger means comprising rigid integral horizontal and cantilevering extensions from each end of the wall for extending over the sidewalls' top edges for bearing thereon, the portion of the vertical rigid wall below the level of the hanger means extending outwardly beyond the innermost boundary of the wheel well cover means and stabilizingly abutting against the wheel well cover means.

4,961,678

REACTOR COOLANT PUMP HAVING DOUBLE DAM SEAL WITH SELF-CONTAINED INJECTION PUMP MECHANISM

David J. Janocko, Forest Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 12, 1988, Ser. No. 231,039

Int. Cl.[5] F02G *1/00*

U.S. Cl. 415—170.1 **13 Claims**

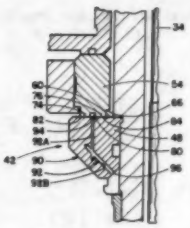
1. For use in a pump having a stationary housing with pressurized fluid therein and a shaft with a rotational axis, a sealing assembly disposable in the housing for sealably mounting the shaft relative to the housing, said sealing assembly comprising:

(a) an annular runner for circumscribing and mounting around the shaft for rotation therewith;

(b) an annular seal ring for circumscribing and mounting within the housing in non-rotational relationship thereto;

(c) said runner and seal ring having respective sealing surfaces facing one another, said sealing surface of one of said seal ring and runner having a pair of radially spaced annular dams formed thereon and defining a seal annulus therebetween, said dams projecting toward said sealing surface of the other of said seal ring and runner and having annular faces thereon capable of contacting said sealing surface on the other of said seal ring and runner, said runner having another, non-sealing surface displaced remote from said sealing surface thereof in a direction parallel to the shaft rotational axis and in a plane separate from the plane of said sealing surface; and

(d) an injection pump mechanism incorporated by said runner being adapted to receive a portion of the fluid in the housing, to route the fluid portion to said seal annulus and,



in response to rotation of said runner with the shaft, to generate a pressure in the fluid portion reaching said annulus that is different than the pressure of the fluid within the housing, said injection pump mechanism including at least one flow passage defined in said rotatable runner, said passage having an outlet disposed at said sealing surface on said runner in flow communication with said seal annulus and an inlet disposed at said non-sealing surface on said runner in flow communication with the fluid within the housing.

4,961,679

AGRICULTURAL BALE ACCUMULATOR WITH BALE TURNING MECHANISM

Roger H. Van Eecke, Blankenberge; Adrianus Naaktgeboren, Zedelgem, and Bart Van Den Bossche, Jabbeke, all of Belgium, assignors to Ford New Holland, Inc., New Holland, Pa.

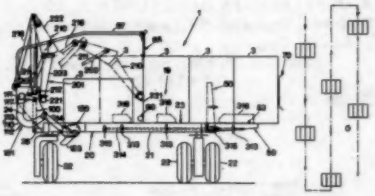
Filed Jul. 11, 1989, Ser. No. 378,663

Claims priority, application European Pat. Off., Jul. 12, 1988, 88.201.479.8

The portion of the term of this patent subsequent to Sep. 11, 2007, has been disclaimed.

Int. Cl.[5] B65G *57/00*

U.S. Cl. 414—111 **25 Claims**



1. An agricultural bale accumulator comprising:

a substantially planar load bed for accumulating thereon a plurality of bales with said bales being received successively one after another in a first direction on said load bed;

bale-turning means for turning each bale through substantially 90 degrees around its longitudinal axis upon receipt on the load bed, wherein each bale remains on said load bed but is reoriented 90 degrees from its initial position;

bale-transfer means operable to displace said bales after receipt and reorientation on the load bed, across said load

bed in a second direction transverse to the first direction and to position said bales in a side-by-side relationship on said load bed thus forming a parcel thereof, and

bale-discharge means operable to discharge said parcel of bales accumulated on the load bed to the ground.

4,961,680

DEVICE FOR LIFTING AND DEPOSITING TRANSPORTABLE LARGE CONTAINERS, E.G. COMPARTMENTS OR THE LIKE

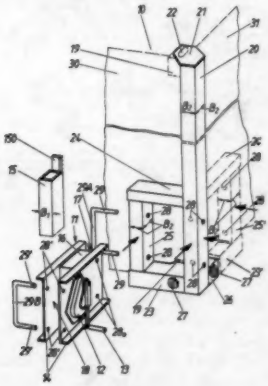
Reinhold Riedl, Miltenberg, and Conrad Lazarus, Freudenberg, both of Fed. Rep. of Germany, assignors to Haacon Hebetechnik GmbH, Fed. Rep. of Germany

Filed Nov. 15, 1985, Ser. No. 798,673

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1984, 3442306

Int. Cl.[5] B60P 1//12

U.S. Cl. 414—458 **8 Claims**



1. Lifting and depositing device for transportable large containers, with first connecting longerons for overhang beams, which can be attached perpendicular to the corner fittings of the large container, which are approximately the height of the container, and which carry rack and pinion jacks having winches that are provided on uprights for the large containers and which can be raised and lowered along each upright, the uprights having wheels, characterized in that the first connecting longerons (20) are arranged at the corners of the large container (10), a pair of laterally extending support arms (23,24) are secured to the lower end portion of each first connecting longeron in vertically spaced relation, and a second connecting longeron (25) extends upwardly between said support arms and is connected thereto, said second connecting longeron being spaced from and being shorter than said first connecting longeron, and said second connecting longeron having means for supporting the overhang beam (11) of a rack and pinion jack (12).

4,961,681

CHUCK FOR ATTACHING UTILITY VEHICLE ACCESSORIES

Raymond W. Threatt, 500 Woodland Dr., No. 28, Florence, S.C. 29501

Filed Dec. 7, 1989, Ser. No. 447,183

Int. Cl.[5] B66F 9/06

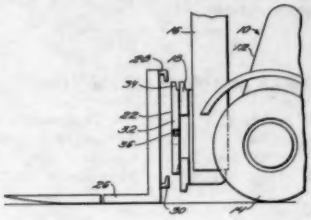
U.S. Cl. 414—607 **18 Claims**

1. An accessory chuck for releasably gripping attachments used with a utility vehicle, comprising:

a upper jaw, and

a lower jaw in slidable contact with said upper jaw; and

means for moving said jaws vertically with respect to each other to a gripping position from a releasing position, said upper and lower jaws holding said attachments firmly when in said gripping position, wherein said lower jaw has a horizontal member with a plurality of vertical spaced-apart extensions integral with said horizontal member and



said upper jaw has a horizontal member with a plurality of spaced-apart extensions depending from and integral with said horizontal member, said extensions of said upper jaw interleaving with said extensions of said lower jaw, one face of each extension of said upper jaw extension engaging one face of each extension of said lowering jaw.

4,961,682

DEVICE FOR PREVENTING DAMAGE TO SHOCK SUSCEPTIBLE PRODUCTS

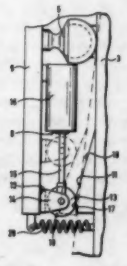
Hans E. G. Nilsson, Skravelsjö 21096, UmeÅ , Sweden (S-905 90)

Filed Sep. 22, 1988, Ser. No. 247,527

Claims priority, application Sweden, Oct. 6, 1987, 8703843

Int. Cl.[5] B66F 9/18

U.S. Cl. 414—620 **6 Claims**



1. A device for preventing damage to shock-susceptible products during handling by a vehicle, said vehicle including hoisting means for raising and lowering said shock-susceptible products, comprising:

transfer means attached to said hoisting means for engaging and disengaging said shock-susceptible products; and

locking means for maintaining the position of said transfer means relative to said hoisting means to prevent undesired movement of said transfer means during handling, said locking means including first and second locking surfaces, said first locking surface including a relatively inclined portion and a relatively non-inclined portion, and at least one corresponding locking unit comprising means for selectively engaging said relatively inclined portion of said first locking surface when maintaining said transfer means in a first orientation or said relatively noninclined portion of said first locking surface when maintaining said transfer means in a second orientation,

wherein said means for engaging said first locking surface engages both said first and second locking surfaces, and wherein said means for engaging said locking surfaces comprises roller means and roller support means, said roller support means arranged to movably engage one of said locking surfaces so that said roller means movably engages said other locking surface.

4,961,683

DEVICE FOR ALIGNING AND LIFTING BLOCKS IN KILN CARS

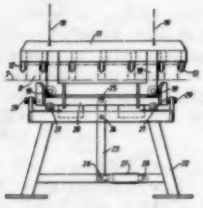
Paul J. G. H. van Huet, Pannerden, Netherlands, assignor to Machinefabriek De Oude Rijn Pannerden B.V., Netherlands

Filed Dec. 1, 1988, Ser. No. 278,707

Claims priority, application Netherlands, Dec. 7, 1987, 8702941

Int. Cl.[5] B66C *1/46*

U.S. Cl. 414—783 **10 Claims**



1. A device for aligning rows of blocks on a kiln car comprising:

means for blocking the kiln car in a desired position relative to the device;

an up-and-down movable lifting mechanism;

clamping means operatively coupled to said lifting mechanism for insertion between the rows of blocks to align them into rows and hold said rows of blocks so that they can be lifted off and placed back on the kiln car by said lifting mechanism with the rows of blocks aligned; and

frame means separate from said lifting mechanism and separate from said clamping means for engagingly receiving said clamping means at a predetermined location relative to said blocked kiln car and for moving said clamping means transversely to the longitudinal direction of the rows of blocks when the clamping means is inserted between said blocks on said kiln car.

4,961,684

METHOD FOR DENESTING AND FEEDING CARTONS TO A CONVEYOR

Alexander R. Provan, Canandaigua, and David G. Vanderlee, Macedon, both of N.Y., assignors to Mobil Oil Corp., New York, N.Y.

Division of Ser. No. 45,504, May 4, 1987, Pat. No. 4,867,632. This application May 22, 1989, Ser. No. 354,598

Int. Cl.[5] B65H *3/28*

U.S. Cl. 414—786 **1 Claim**

1. A method for denesting and feeding cartons to a conveyor comprising:

placing a plurality of nested cartons in a vertical stack,

supporting the stack of nested cartons on opposite sides at the bottom of the stack,

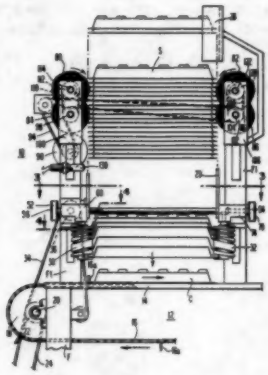
preseparating and feeding the nested cartons from the bottom of the stack to a pair of feed screws having grooves of opposite hand positioned in spaced relation to receive the opposite ends of the cartons,

the axis of the feed screws being tilted with respect to the vertical axis of the stack to compensate for the lead angle of the feed screws so that the cartons ride flat in the grooves of the feed screws to allow a wider variation in thickness of the cartons at the screw pickup points,

rotating the feed screws in counter directions,

engaging a plurality of the cartons in a first section of the feed screws having a pitch matching the spacing of the nested cartons for distributing the weight of the stack of cartons over a plurality of the cartons rather than only on the bottom carton of the stack to avoid distortion of the carton and permitting the lead edge of the feed screws to enter the nested stack without damaging the cartons,

moving the cartons into a second section of the feed screws



having an increased pitch serving to separate the bottommost carton from the stack thereby causing the carton to tip slightly whereby the carton is out of parallel with the conveyor upon which the carton is to be placed,

moving the carton to a third section of the feed screws where the groove pitch is zero for 120° of screw rotation to cause the carton to level out parallel with the conveyor onto which the carton is to be placed, and

moving the carton into a fourth section of the feed screws where the pitch is substantially equal to the pitch of the first section of the feed screws thereby giving the carton a downward kick onto the conveyor.

4,961,685

PROTECTION RING OF FIBER MATERIAL FOR CONTAINING FRAGMENTS OF BURSTING STRUCTURAL COMPONENTS

Horst Neubert, Unterhaching, Fed. Rep. of Germany, assignor to MTU-Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 1, 1989, Ser. No. 402,053

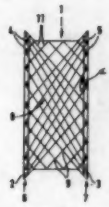
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1988, 3830232

Int. Cl.[5] F01D *25/24*

U.S. Cl. 415—197 **16 Claims**

1. A protection ring structure of fiber material for containing fragments of a bursting structural component passing through a housing defining a longitudinal axis, comprising a plurality of fiber retaining pins, means mounting said fiber retaining pins to

said housing in such positions that said pins encircle said housing, and fiber strands looping at least partially around said



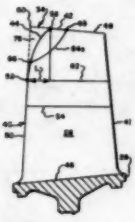
retaining pins for forming a fiber strand netting all around a zone of said housing to be protected.

4,961,686

F.O.D.-RESISTANT BLADE

Lawrence W. Blair, Boxford, and Robert A. Schaefer, North Reading, both of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Feb. 17, 1989, Ser. No. 312,093
Int. Cl.[5] F01D *5/14*
U.S. Cl. 416—223 A **11 Claims**



1. A gas turbine engine blade comprising:

an airfoil portion bounded by a root and a tip spaced radially apart, said tip having a chord length C and a maximum thickness T and a T/C ratio of no greater than about 0.04, and a leading edge and a trailing edge spaced axially apart, said leading and trailing edges extending from said root to said tip; and

means for increasing tip curl resistance of said airfoil portion, including a tip portion of said leading edge swept back from a first leading edge point disposed radially outwardly of about a mid span of said airfoil portion to a second point at said tip.

4,961,687

FASTENING DEVICE INCLUDING SLEEVES, AND ROTOR BLADE EQUIPPED WITH SUCH A DEVICE FOR FASTENING TO A HUB

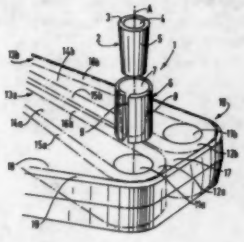
Michel Bost, Joinville le Pont, and Alain Chasson, Villeneuve La Garenne, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris Cedex, France

Filed Sep. 8, 1988, Ser. No. 242,409
Claims priority, application France, Sep. 9, 1987, 87 12529
Int. Cl.[5] B64C *27/46*
U.S. Cl. 416—230 **8 Claims**

1. A rotor blade for an aerodyne having an at least partially rotating wing system, said blade being constructed substantially of composite materials and having a resistant frame which includes at least one spar comprising at least one bundle of continuous filaments having high mechanical strength, said filaments being selected from the group consisting of inorganic and organic filaments and being agglomerated by a polymerized synthetic resin, said bundle forming, in a root of said spar by which said blade is intended to be operatively fastened to a blade-to-hub attachment part, at least one loop accommodating and integral with an internal sleeve-fastening device comprising first and second metallic and coaxial sleeves for absorbing forces, said sleeves being adapted to be traversed by an axle for retaining said blade on said blade-to-hub attachment part, wherein

(a) said first sleeve is an inner sleeve having a frusto-conical outer lateral face centered on an axis, and a cylindrical internal bore for passage and engagement of said axle, and coaxial with said frusto-conical outer lateral face around said axis; and

(b) said second sleeve is an outer sleeve having a cylindrical outer lateral face centered on said axis, two plane axial end faces perpendicular to said axis, and a frusto-conical internal bore extending from one to the other of said end faces, said bore being coaxial with said cylindrical outer lateral



face and having a shape complementary to that of said frusto-conical outer lateral face of said inner sleeve, said outer sleeve being provided with a single slot extending from one to the other of said axial end faces, said inner sleeve being adapted to be pressed coaxially into said outer sleeve and made integral with said outer sleeve in an axial position corresponding to a predetermined deformation in radial expansion of said outer sleeve, which is integral by said cylindrical outer lateral face with said blade spar root, said cylindrical outer lateral face of said outer sleeve having a central part extending between two annular parts of said cylindrical outer lateral face which annular parts are each adjacent to a respective one of said axial end faces of said outer sleeve, and said central part being at least partially made integral with an opposite part of said bundle of filaments, in a portion of said bundle which surrounds said outer sleeve, by means of at least one protection element affixed to both said outer sleeve and to said bundle of filaments.

4,961,688

PROCESS AND APPARATUS FOR PUMPING AND METERING A LIQUID PRODUCT WITH A MELTING POINT BETWEEN 200 AND 350 DEGREES C.

Pierre Brun, Grenoble, France, assignor to Compagnie Europeene du Zirconium Cezus, Courbevoie, France

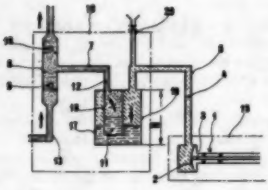
Filed Jan. 9, 1989, Ser. No. 294,409
Claims priority, application France, Jan. 21, 1988, 88 01007
Int. Cl.[5] F04B *19/04*
U.S. Cl. 417—92 **6 Claims**

3. Apparatus for pumping a liquid product having a melting point between about 200° and 350° C. at a temperature between about 210° and 380° C., comprising:

a pulsation head including a piston and a diaphragm;

a siphon means partially filled with a molten alloy selected from the group consisting of a Sn-Pb alloy containing Pb≦70% by weight, a Sn-Cu alloy containing Cu≦8% by weight, and a Sn-Pb-Cu alloy containing pb≦70% and Cu≦8% by weight;

a pumping head including a unidirectional suction valve allowing liquid flow only into said pumping head, and a unidirectional delivery valve allowing liquid flow only out of said pumping head, said pumping head having no diaphragm between said intake valve and said delivery valve;



first conduit means adapted to contain a thermal fluid and connecting said pulsation head to one side of said siphon means, said diaphragm isolating said piston from said first conduit means; and

second conduit means connecting the opposite side of said siphon means to said pumping head in a manner which permits bi-directional liquid flow between said second conduit means and said pumping head.

4,961,689

POSITIVE DISPLACEMENT VACUUM PUMPS

Anestis S. Avramidis, 1605 W. St. Andrews, Midland, Mich. 48640

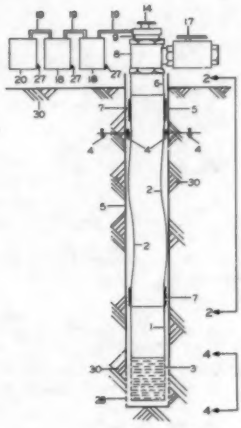
Continuation-in-part of Ser. No. 311,086, Feb. 15, 1989, which is a continuation-in-part of Ser. No. 78,794, Jul. 27, 1987, Pat. No. 4,832,577. This application Jun. 28, 1989, Ser. No. 373,185

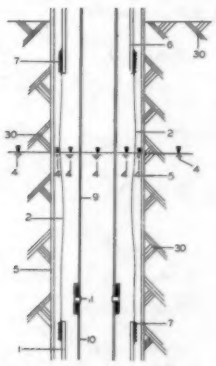
The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.

Int. Cl.[5] F04F *1/06*

U.S. Cl. 417—118 **6 Claims**

1. A well pumping system for use in an elongate well, said pumping system comprising: A rigid and elongate inner casing in fluid communication with the well for discharging well and pressurized fluids; a flexible and elongate outer casing disposed around said inner casing; an elongate opening disposed between said inner and outer casings, in fluid communication with said well, for receiving well and pressurized fluids; pumping means for pumping well fluids, such pumping means being in fluid communication with said well, said elongate opening and the opening through said inner casing; said outer casing deforming outwardly in response to said pressurized fluids, to force the well fluids outside said outer casing to move longitudinally of said outer casing towards said pumping means, and to engage the walls of the well to form a seal; said well fluids in said elongate opening forced longitudinally of said outer casing towards said pumping means in response to the pressurized fluids; said pumping means receives fluids from said well





and said elongate opening, and discharges said fluids through the opening of said inner casing to the ground surface.

4,961,690

VARIABLE DISPLACEMENT TYPE COMPRESSOR

Yoshirou Simoyama; Toyohei Nakajima; Nobuyuki Tanaka, and Tetsuya Miyake, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 21, 1989, Ser. No. 382,940

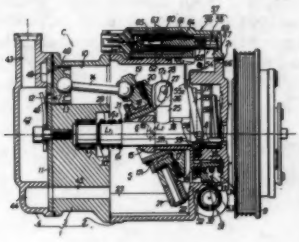
Claims priority, application Japan, Aug. 2, 1988, 63-102598[U]

Int. Cl.[5] F04B *1/26*

U.S. Cl. 417—222 **3 Claims**

1. A variable displacement type compressor comprising: a casing having a working chamber internally defined therein and a plurality of cylinder bores provided therein and opened to face to said working chamber; a driving shaft rotatably carried in the casing with the cylinder bores disposed around the driving shaft; a working piston slidably received in each of the cylinder bores; a sleeve axially slidably fitted over the driving shaft within the working chamber; a holder carried on the sleeve for swinging movement about an axis perpendicular to an axis of the driving shaft and connected to the driving shaft; a swingable swash plate carried on said holder and connected to said working pistons through connecting rods; a control piston connected to the sleeve and slidably received in

the casing so as to vary the angle of inclination of said holder and said swingable swash plate to vary the operation stroke of the working pistons; and stroke detecting means for detecting the operation stroke of the working pistons, wherein said stroke detecting means comprises an interlocking member



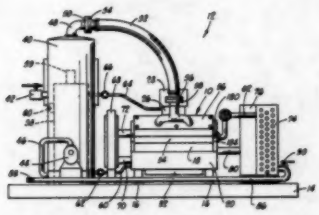
supported at a middle portion on the casing through a support shaft having an axis perpendicular to the axis of the driving shaft and said interlocking member connected at one end thereof to the control piston, and a position detector disposed on the casing to detect the position of the other end of said interlocking member.

4,961,691

INTEGRAL GAS COMPRESSOR AND INTERNAL COMBUSTION ENGINE

James L. Waldrop, Woodward, Okla., assignor to EconoFab, Inc., Oklahoma City, Okla.

Filed Oct. 27, 1989, Ser. No. 427,576
Int. Cl.[5] F04B *41/04*
U.S. Cl. 417—237 **12 Claims**



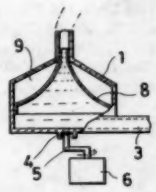
1. An integral gas compressor and internal combustion engine apparatus comprising:
- a cylinder block defining a plurality of cylinder bores in first and second banks;
- a crankshaft rotatably disposed in said cylinder block;
- an engine piston disposed in each of said cylinder bores in said first bank;
- a compressor piston disposed in each of said cylinder bores in said second bank;
- a connecting rod connecting each of said engine and compressor pistons with said crankshaft;
- an engine head attached to said cylinder block adjacent to said first bank;
- an engine manifold attached to said cylinder block in communication with said engine head;
- a compressor head attached to said cylinder block adjacent to said second bank, said compressor head defining:
  - a plurality of valve pockets, each of said valve pockets being aligned with a cylinder bore in said second bank;
  - a discharge passageway in communication with said valve pockets; and
  - a discharge opening in communication with said discharge passageway;
- a concentric compressor valve disposed in each of said valve pockets;
- a valve chair positioned adjacent to each of said valves, each valve chair being attached to said compressor head and defining:
  - an inlet flow path; and
  - a discharge flow path in communication with said discharge passageway in said compressor head;
- an inlet manifold attached to said compressor head such that said inlet manifold encloses said valve chairs and is in communication with said inlet flow paths in said valve chairs; and
- sealing means for sealing between said inlet manifold and said compressor head.

4,961,692

OSCILLATING VESSEL PUMP

Yasuhiro Fukui, 52-10-1–3, 5-chome, Higashiikebukro, Toshima-ku, Tokyo, and Osamu Miyashita, 2-5, 2-chome, Takakura, Iruma-shi, Saitama-prf., both of Japan

Division of Ser. No. 185,029, Apr. 22, 1988, Pat. No. 4,869,650.
This application May 16, 1989, Ser. No. 352,344
Claims priority, application Japan, Apr. 22, 1987, 62-97436
Int. Cl.[5] F04B *7/00*
U.S. Cl. 417—241 **2 Claims**



1. An oscillating vessel pump comprising:
- a vessel having an inlet for liquid and an outlet opening in a tangential direction of an outer peripheral portion thereof;
- means for oscillating said vessel about an axis substantially transverse to said tangential direction; and
- a horned shaped membrane formed of a flexible synthetic resin, said membrane being positioned in said vessel and secured at upper and lower ends thereof to said vessel so as to form a gas space.

4,961,693

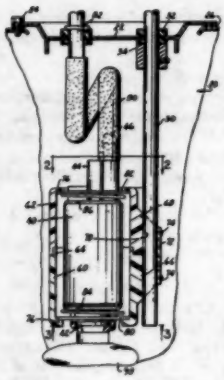
FUEL PUMP ISOLATION MOUNT

Thomas M. Hoover, Reese, and Edward J. Talaski, Caro, both of Mich., assignors to Walbro Corporation, Cass City, Mich.

Filed Dec. 16, 1988, Ser. No. 284,996
Int. Cl.[5] F04B *35/04*
U.S. Cl. 417—363 **5 Claims**

1. In a fuel system for passenger vehicles wherein an electric fuel pump is utilized to move fuel from a fuel tank to a fuel distribution device at an internal combustion engine and having a pressure regulator valve to direct excess fuel back to the fuel tank, an improvement to reduce noise emission and vibration which comprises:
- (a) a fuel pump having a generally cylindrical casing with side walls and end walls,
- (b) an open-ended enclosure surrounding said pump having walls spaced from the side walls and the end walls of said pump casing to allow the flow of fuel around said pump casing,
- (c) means to suspend said enclosure in a fuel tank, and
- (d) resilient coil springs at each end of said pump casing

bearing at one end respectively against an end wall of said pump casing and bearing at the other end against the



interior of said enclosure to resiliently isolate and float said pump within said enclosure.

4,961,694

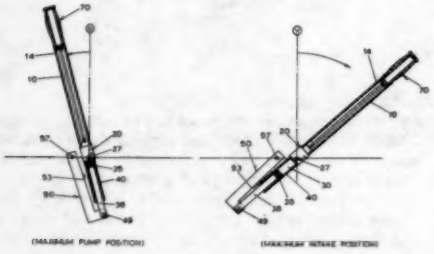
LEVER ARM PUMP

William W. Gardetto, 1721 Louella Ct., Hurst, Tex. 76054

Filed Apr. 24, 1989, Ser. No. 342,043

Int. Cl.[5] F04B *19/02*

U.S. Cl. 417—464 **4 Claims**



1. A hand pump for pumping fluid to an operating device, comprising:

a unitary pump handle extending in a generally vertical direction; a cylindrical reservoir forming an upper section of said handle and having an inlet near the top thereof; a cylindrical pump housing forming a lower portion of said handle; a plug which is inserted into and seals one end of said reservoir, said plug having a handle attached thereto, a valve casing having one end inserted into and sealing said reservoir and the other end inserted into and sealing said pump housing to connect said reservoir and said pump housing in a linear series to form said handle;

a piston in said pump housing; pivot means supporting said handle at said valve casing for movement about a generally horizontal axis;

a pump chamber formed between said piston and said valve casing; a link arm; means pivotally securing a point on said link arm on an axis close to said handle which is fixed respecting said generally horizontal axis;

a piston rod having one end attached to said piston and the other end pivotally connected to said link arm at a location vertically spaced from the means pivotally supporting a point on said link arm such that lateral movement of said handle causes said piston to slide within said pump housing and change the size of said pump chamber;

one way flow regulating means in said valve casing which allows fluid to flow only from said reservoir into said pump chamber when said piston slides in a direction to enlarge said pump chamber, and allows said fluid to flow only from said pump chamber to an operating device when said piston slides in a direction to decrease the size of said pump chamber; and a single release means to open said flow regulating means to two way flow.

4,961,695

FACILITY FOR GENERATING FIBERS, IN PARTICULAR MINERAL FIBERS, FROM A MOLTEN MASS

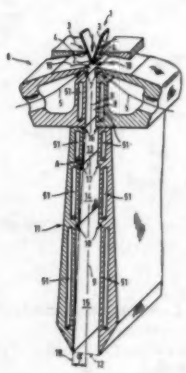
Clemens Hirschmann, Ilvesheim; Heinz-Jürgen Ungerer, Viernheim, and Joachim Mellem, Schriesheim, all of Fed. Rep. of Germany, assignors to Grunzweig & Hartman AG, Fed. Rep. of Germany

Filed Feb. 28, 1989, Ser. No. 316,705

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1988, 3807420

Int. Cl.[5] C03S *37/02*

U.S. Cl. 425—72.2 **16 Claims**



1. Apparatus for generating mineral fibers from a molten mass according to a blast drawing process, said apparatus comprising:

a blast pipe having a drawing gap through which at least one primary fiber from the molten mass can be fed and unraveled towards an emergence opening under influence of blast streams that are laterally blasted-in in the direction of the primary fiber; and

a subsonic diffuser having flow borders coupled to the emergence opening of the blast pipe, which diffuser is used to delay gas-fiber dispersion and solidify the molten fiber into compact fibers;

wherein the subsonic diffuser is designed as a thrust diffused with at least one sudden cross-sectional widening of the flow borders.

4,961,696

INJECTION MOLDING MACHINE WITH A RESIN PRESSURE DETECTING FUNCTION

Masato Yamamura, Oshino, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

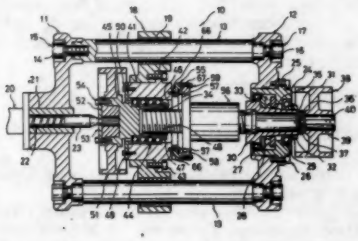
PCT No. PCT/JP88/00741, § 371 Date Mar. 15, 1989, § 102(e) Date Mar. 15, 1989, PCT Pub. No. WO89/00915, PCT Pub. Date Feb. 9, 1989

PCT Filed Jul. 22, 1988, Ser. No. 329,787

Claims priority, application Japan, Jul. 24, 1987, 62-183449

Int. Cl.[5] B29C *45/77*

U.S. Cl. 425—149 5 Claims



1. In an injection molding machine of a type having an injection unit which includes a metering bearing housing having a front face and a rear face and disposed for movement in unison with a metering screw, and a ball screw/nut mechanism for causing reciprocal movement of the metering screw with the housing, an injection molding machine with a resin pressure detector, comprising:

an annular member having a front face and a rear face;

a resin pressure detecting element mounted on said annular member;

a first fixture means for fixing said annular member on the rear face of the metering bearing housing; and

a second fixture means for fixing a ball nut of the ball screw/nut mechanism on the rear face of said annular member;

said annular member having an undeformable portion at which no substantial deformation is found when corresponding ones of the rear face of the housing, the annular member and the ball nut are fixed by means of said first and second fixture means, respectively, the resin pressure detecting element being mounted on the undeformable portion of said annular member.

4,961,697

DOUGH PIECE BENDING DEVICE

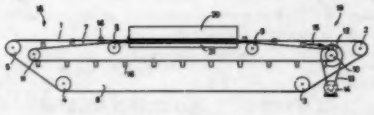
Gijsbert De Fockert, Herwijnen, and Armin G. Seegers, Zoelen, both of Netherlands, assignors to Machinefabriek C. Rijkaart B.V., Netherlands

Filed Feb. 16, 1989, Ser. No. 311,592

Claims priority, application Netherlands, Feb. 17, 1988, 8800402

Int. Cl.[5] A21C *11/00*; B29C *53/02*

U.S. Cl. 425—327 19 Claims



1. A device for bending elongated dough products, said device comprising:

a first conveyance means for conveying a plurality of elongated dough products along a conveyance path, said first conveyance means including a plurality of spaced apart passages each near a dough product on said first conveyance means;

a second conveyance means which includes a plurality of spaced apart mandrels;

means for moving said first conveyance means and said second conveyance means such that (a) said mandrels are successively fed upwardly into respective said passages, (b) said mandrels are then moved together with said first conveyance means along the conveyance path and (c) said mandrels are then removed from said passages; and

bending means located on either side of the conveyance path for successively bending each of the elongated dough products around a said mandrel as the dough products are conveyed along the conveyance path.

4,961,698

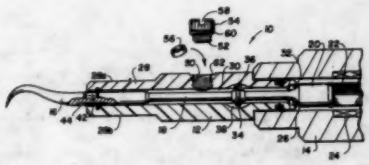
ULTRASONIC DEVICE WITH ADDITIVE CHAMBER

David G. Vlock, 12 Fifth Ave., New York, N.Y. 10011-8857

Filed Jun. 16, 1989, Ser. No. 367,243

Int. Cl.[5] A61C *3/08*

U.S. Cl. 433—86 16 Claims



1. An ultrasonic device for use with a cleansing fluid and additive comprising:

a handle assembly having a supply chamber and carrying first ultrasonic means for causing ultrasonic vibrations;

an insert assembly detachably engaged with said handle assembly and including a portion for insertion into said supply chamber;

said insert assembly comprising a tool, a shank connected to said tool and second ultrasonic means connected to said shank and operable with said first ultrasonic means to ultrasonically vibrate said shank and tool, said insert assembly including a sleeve engaged around said shank and defining an annular chamber with said shank, said annular chamber having an inlet end communicating with said supply chamber and an output end communicating with said tool, said shank including a nodal point and said shank being fixed to said sleeve at said nodal point;

auxiliary chamber means connected to said sleeve and defining an auxiliary chamber communicating with said annular chamber for receiving an additive for introducing the additive into a flow of cleansing fluid passing through said annular chamber and into said auxiliary chamber, said auxiliary chamber means comprising a substantially radial bore through said sleeve opening into said annular chamber for exposing said shank, said bore being spaced away from said nodal point and;

closure means connected to said auxiliary chamber means for opening said auxiliary chamber for introduction of an additive thereto and for closing said auxiliary chamber to prevent loss of fluid through said auxiliary chamber, said closure means comprising a cap for closing an outer end of said bore.

4,961,699

APPARATUS FOR FOAMING BUBBLES

R. Gilbert Moore, North Ogden, Utah, assignor to Thiokol Corporation, Ogden, Utah

Filed May 31, 1988, Ser. No. 200,601

Int. Cl.[5] B64G *4/00*; B29C *49/28*

U.S. Cl. 425—387.1 **5 Claims**

1. An apparatus for forming bubbles comprising an expandable torus shaped member having a circular axis and being rollable upon itself about said circular axis whereby a bubble attachment line thereon may be repositioned from a first position inwardly of said circular axis to a second position outwardly of said circular axis, means for providing bubble forming fluid for forming a bubble attached to said bubble attachment line, means for providing pressurized gas for blowing the bubble, and an elastic membrane which extends tautly between and is wrapped about the outside of said torus shaped member and which has an edge portion which is attached to said torus shaped member to effect rolling of said torus shaped member upon itself about said circular axis to said second position with said membrane attached thereto as said torus shaped member is expanded.

4,961,700

SHAPING MEANS FOR THE PRODUCTION OF FIBER-REINFORCED PREFORM ARTICLES

Sidney Dunbar, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 284,581, Dec. 15, 1988, abandoned, which is a continuation of Ser. No. 35,555, Apr. 7, 1987, abandoned. This application Aug. 10, 1989, Ser. No. 392,181

Int. Cl.[5] B29C *67/14*

U.S. Cl. 425—394 **6 Claims**

1. A shaping apparatus for the production of fiber reinforced preform articles having a contoured shape comprising, in combination:

a first screen member having a surface defining the contoured shape of the article;

a second screen member having a complementary surface defining a reverse contoured shape of the article;

means for placing a fiber matting between said first screen member and said second screen member;

means for moving said first screen member and said second screen member in a direction toward each other; and

at least one resilient presser means operatively attached to said first screen or said second screen for engaging a portion of said fiber matting and pressing said fiber matting into a portion of either said first screen member or said second screen member before said screen members are moved together; the pressure of said presser means against said engaged portion of said fiber matting forcing said engaged portion of said fiber matting into said portion of either said first screen member or said second screen member, said presser means anchoring said portion of said fiber matting in said portion of either said first screen member or said second screen member, the balance of said fiber matting having at least one point of contact with said surface of either said first screen member or said second screen member, said balance of said fiber matting opposite said point of contact being free to slideably move with respect to said complementary surface of either said first screen member or said second screen member such that said balance of said fiber matting is not stretched, and is not compressed at said point of contact as said balance of said fiber matting moves in a direction toward said engaged portion of said fiber matting; said first screen member and said second screen member shaping said fiber matting and applying molding pressure to said shaped fiber matting.

4,961,701

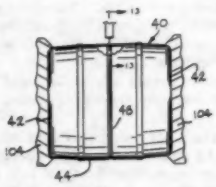
APPARATUS FOR FORMING PLASTIC BOTTLE BASE CUPS

John M. Barth, Chelsea, Mich., assignor to Hoover Universal, Inc., Ann Arbor, Mich.

Division of Ser. No. 114,092, Oct. 27, 1987, Pat. No. 4,883,188, which is a continuation-in-part of Ser. No. 934,340, Nov. 24, 1986, abandoned. This application Feb. 10, 1989, Ser. No. 308,557

Int. Cl.[5] B29C *49/50*

U.S. Cl. 425—527 **2 Claims**



1. Apparatus for forming base cups for plastic bottles wherein each base cup is generally cup shape having a bottom wall and an upright tubular side wall terminating in a continuous generally circular lip, said apparatus comprising:

(a) blow molding means operable to form a hollow body corresponding in shape to the shape of two of said base cups secured in lip-to-lip engagement, said body having end walls corresponding to the bottom walls of said base cups;

(b) means for engaging said end walls of said hollow body for rotating said body along a first predetermined path;

(c) knife means projecting into said first predetermined path for dividing said body along a line substantially midway between said end walls and extending diametrically through said body side wall to thereby divide said body into two base cups, each of which terminates at one end in said circular lip; and

(d) means for carrying said end wall engaging means along a second predetermined path passing said knife means whereby said end wall engaging means rotates said body along said first predetermined path in which said knife means divides said body.

4,961,702

RETAINER FOR INJECTION MOLDS

Frederick C. Kern, Rochester Hills, Mich., assignor to Fairchild Industries, Inc., Chantilly, Va.

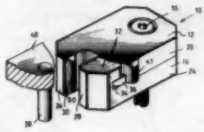
Filed Feb. 21, 1989, Ser. No. 313,196

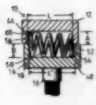
Int. Cl.[5] B29C *45/66*

U.S. Cl. 425—595 **15 Claims**

1. A retainer for engaging an object comprising a first jaw

member, a second jaw member for cooperating with said first jaw member, said jaw members each having an outer object engaging portion for engaging said object, connecting means for pivotally connecting said first jaw member and said second jaw member at a single pivot location and a spring member having two end portions located between the outer object engaging portions of said jaw members and said connecting means with one spring member end portion located with respect to said first jaw member to cause said first jaw member to only press against and exert a force against a portion of the one end portion of said spring member and with the other spring member end portion located with respect to said second jaw member to cause said second jaw member to only press against and exert a force against a portion of the end of the other end portion of said spring member to cause the object engaging portions of said jaw members to exert a force toward each other when said jaw members are in use to engage said object.



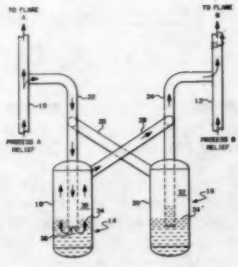


4,961,703

LOAD SHARING FOR PARALLEL FLARES

Thomas A. Morgan, Pampa, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 19, 1989, Ser. No. 298,706
Int. Cl.[5] F23D *23/00*
U.S. Cl. 431—5 **11 Claims**



7. A method for effecting load-sharing between a first flare and a second flare wherein a first manifold header transports combustible waste gases from a first process to said first flare, and a second manifold header transports combustible waste gases from a second process to said second flare, said method comprising the steps of:

establishing a first flow path from said first manifold header to said second manifold header and establishing a second flow path from said second manifold header to said first manifold header;

sealing said first flow path and said second flow path when the actual pressures in said first manifold header and in said second manifold header are essentially equal;

connecting said first manifold header to said second manifold header through said first flow path and sealing said second flow path when the actual pressure in said first manifold header is greater than the actual pressure in said second manifold header by a predetermined amount; and

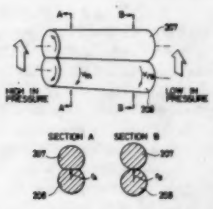
connecting said second manifold header to said first manifold header through said second flow path and sealing said first flow path when the actual pressure in said second manifold header is greater than the actual pressure in said first manifold header by a predetermined amount.

4,961,704

SHEET MEANDERING MOVEMENT PREVENTING METHOD

Shigeo Nemoto; Osamu Namikawa; Kiyomi Tsuchiya; Isao Nakajima; Yasuo Kikuchi; Tomio Sugaya; Toshitaka Ogawa, and Sigenobu Katagiri, all of Ibaraki, Japan, assignors to Hitachi Koki Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 188,869, May 2, 1988, abandoned. This application Jul. 7, 1989, Ser. No. 377,755
Claims priority, application Japan, Apr. 30, 1987, 62-107600
Int. Cl.[5] F27B *9/28*
U.S. Cl. 432—8 **3 Claims**



1. A method of preventing the meandering movement of a sheet conveying device in which a sheet bearing a toner image is passed through an elastic heating roll rotatably supported at both ends and having a drive source at one end thereof forming a driven side for rotating said elastic heating roll and an elastic pressure roll held in roll contact with said heating roll by a frictional force therebetween, and which includes means for changing the contact pressure of said heating and pressure rolls in the axial direction of said heating roll, the method comprising the steps of:

setting the contact pressure of said heating and pressure rolls on said driven side thereof in the axial direction of said heating roll to be higher than that on a non-driven side when conveyance of said sheet is started to attendantly reduce an apparent radius of said driven side of said heating roll and thereby compensate for a higher peripheral speed on said driven side of said heating roll caused by a torsional twisting of said heating roll at start-up;

making said contact pressure on both of said driven and non-driven sides of said heating and pressure rolls equal to each other after a predetermined period of time elapses, to prevent the meandering movement of said sheet at the time of conveyance of said sheet.

4,961,705

FLUIDIZED BED REACTOR HAVING A HOUSING CASE FROM STEEL

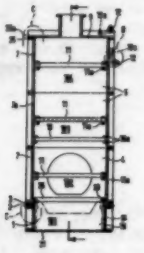
Peter Schulz, and Knut Vaupel, both of Essen, Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 363,881, May 25, 1989, abandoned. This application Feb. 9, 1990, Ser. No. 478,723

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1986, 3639966

Int. Cl.[5] F27B *15/00*

U.S. Cl. 432—58 9 Claims



1. A fluidized-bed reactor composed of steel castings and comprising:

an upwardly open mounting frame of rectangular plan configuration, closed below by a base plate and provided at an upper portion with a screen plate;

a support frame of rectangular plan configuration on said mounting frame, said support frame having an upper surface formed along one side with a first longitudinally extending recess and along an adjoining side with a respective guiding and securing element;

a sliding frame of rectangular plan configuration on said mounting frame, said sliding frame having a lower surface and an upper surface, said lower surface being formed with a second longitudinally extending recess registering with said first longitudinally extending recess and a third longitudinally extending recess receiving said guiding and securing element, said upper surface of said sliding frame being formed with fourth longitudinally extending recess;

a plurality of reactor housing segments of rectangular plan configuration disposed one upon another and including a segment mounted on said sliding frame, said segments each being assembled from a plurality of wall modules of different dimensions having respective holding flanges with adjacent wall modules of each segment having adjoining pairs of flanges, one of the flanges of each adjoining pair being formed with a receiving pin, said segments being formed with confronting upper and lower surfaces having mutually registering fifth recesses and said segment mounted on said sliding frame having a lower surface formed with sixth recesses registering with said fourth recesses;

respective guiding and securing elements received in said first and second recesses, in said fourth and sixth recesses and in said fifth recesses and bridging the registering recesses in which they are received;

holding clamps on said pins clamping said adjoining flanges together, said surfaces of said segments being defined by supporting flanges, said holding flanges, said supporting flanges and said sliding frame being formed with peripherally open grooves;

respective sealing elements received in said grooves for sealing along said adjoining flanges and said surfaces of said segments and said sliding frame;

sealing contact pressure bars pressed against said seals; and

securing members mounted on said sliding frame for retaining the pressure bars of said sliding frame in the respective grooves.

4,961,706

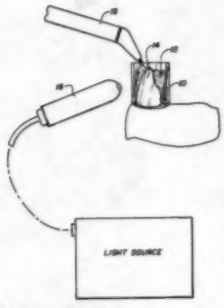
METHOD FOR OBTAINING A BAND TECHNIQUE DENTAL IMPRESSION

Steven R. Jefferies, Milford, Del., assignor to Dentsply Research & Development Corp., Milford, Del.

Filed Jul. 7, 1988, Ser. No. 216,050

Int. Cl.[5] A61C *9/00*

U.S. Cl. 433—214 8 Claims



1. A method for obtaining a dental impression comprising the steps of

(a) filling an actinic light transparent, substantially continuous preformed band with visible light polymerizable impression material,

(b) placing said transparent, substantially continuous preformed band to loosely surround preparations of one or more teeth,

(c) applying actinic light to said impression material through said transparent band and polymerizing said impression material to form an impression, and

(d) contacting said band and polymerized impression material with additional impression material covering the band and surrounding structures.

4,961,707

GUIDED PERIODONTAL TISSUE REGENERATION

Ingvar Magnusson, High Springs, and Christopher Batich, Gainesville, both of Fla., assignors to University of Florida, Gainesville, Fla.

Continuation of Ser. No. 136,772, Dec. 22, 1987. This application Jun. 6, 1989, Ser. No. 362,246

Int. Cl.[5] A61C *5/02;* A61K *6/00;* A61M *31/00*

U.S. Cl. 433—215 8 Claims

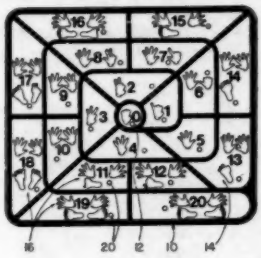
1. A method of enhancing the regeneration of periodontal connective tissue at root surfaces exposed by peridontal surgery comprising covering said exposed root surfaces with a membrane which excludes contact between said root surfaces and gingival epithelium and gingival connective tissues and permits migration to said root surfaces of PDL cells after surgery, said membrane having pores therein of a size of from about 10μ to about 500μ and a thickness of from about 50 μ to about 200μ and being constructed substantially of a non-toxic, non-immunogenic, bio-absorbable material.

4,961,708

EDUCATIONAL PUZZLE

William Van Niekerk, 55 Wildwood Park, Winnipeg, Manitoba, Canada R3T 0C8

Filed Jul. 25, 1989, Ser. No. 384,436
Claims priority, application United Kingdom, Jul. 29, 1988, 8818103
Int. Cl.[5] G09B 17/00, 1/00
U.S. Cl. 434—406 16 Claims



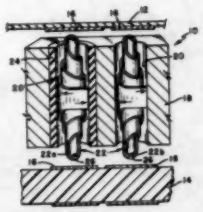
1. An educational puzzle comprising:
a base panel with front and back faces;
a plurality of holes through the base panel;
a plurality of puzzle pieces with front and back faces and having pegs extending therethrough, the puzzle pieces being configured to fit together in a first array on the front face of the base panel with the front faces of the puzzle pieces exposed and the pegs engaged in respective ones of the holes, and to fit together in a second array on the back face of the base panel with the back faces of the puzzle pieces exposed and the pegs engaged in respective ones of the holes.

4,961,709

VERTICAL ACTION CONTACT SPRING

Rocco J. Noschese, Wilton, Conn., assignor to Burndy Corporation, Norwalk, Conn.

Filed Feb. 13, 1989, Ser. No. 310,325
Int. Cl.[5] H01R 9/09
U.S. Cl. 439—66 9 Claims



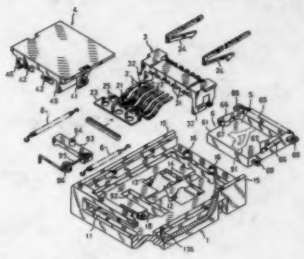
1. An electrical connector for positioning within an opening in a carrier block member between spaced electric circuit surfaces comprising a one-piece blank in the form of a base with projecting divergent arm members rolled into a spiral of at least three complete coils when radially compressed, having longitudinally spaced contact surfaces formed of the ends of the arm members, being longitudinally resilient to establish electric contact between its contact surface and the circuit surfaces, and being radially resilient to establish firm engagement between the rolled base portion of the spring and the carrier opening when the spring is longitudinally compressed.

4,961,710

MEMORY CARD CONNECTOR

Yasuhiro Komatsu, Osaka, Japan, assignor to Hosiden Electronics Co., Ltd., Yao, Japan

Filed Mar. 29, 1989, Ser. No. 330,267
Claims priority, application Japan, Apr. 8, 1988, 63-47838[U]
Int. Cl.[5] H01R 13/629
U.S. Cl. 439—267 6 Claims



1. A memory card connector comprising:
a connector body defining a front-to-back direction;
contact pieces mounted on said connector body and positioned as projecting toward a set position of a memory card, said contact pieces being movable in a direction away from said set position;
a raised guide surface formed on said connector body;
resilient means;
a slider mounted on said connector body in a manner slidable in the front-to-back direction thereof, said slider being normally biased forward by said resilient means;
a spacer disposed between said connector body and said slider in a manner movable in the front-to-back direction;
an engagement portion disposed on said slider, said engagement portion being adapted to be opposite to the tip of a memory card when the same is inserted;
a pushing portion disposed on said slider such that, when said slider is pushed by the memory card, said pushing portion pushes said spacer so that said spacer gets over said guide surface from the front side thereof to the rear side thereof;
a hooking portion disposed, as separated from said pushing portion, on said slider such that, when said slider is pushed against said resilient means, said hooking portion catches said spacer, causing said spacer to get over said guide surface from the rear side thereof to the front side thereof; and
a cam mechanism disposed between said connector body and said slider and arranged such that, when said spacer rides the top of said guide surface from the front side thereof, said cam mechanism operates to hold said slider at a position where the memory card is held at said set position, and such that, when said slider is further pushed from said position such that said spacer gets over said raised portions of said guide surface, said cam mechanism operates to release said slider from said position.

4,961,711

ELECTRICAL CONNECTOR

Yoshitsugu Fujiura, Tokyo; Shigeru Ishikawa, Hachioji, and Hiromitsu Kodama, Yokohama, all of Japan, assignors to AMP Incorporated, Harrisburg, Pa.

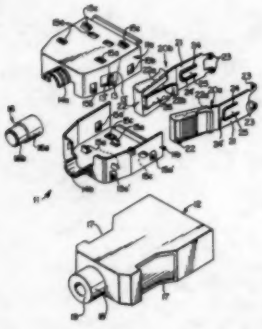
Filed Jun. 14, 1989, Ser. No. 366,062
Claims priority, application Japan, Jul. 15, 1988, 63-176324
Int. Cl.[5] H01R 13/62
U.S. Cl. 439—357 6 Claims

1. A shielded electrical connector for matable and latchable electrical connection with a complementary electrical connector, comprising:

an electrical contact assembly including dielectric housing means having electrical contacts secured in the housing means, the electrical contacts having contact sections;

metal shield means covering said electrical contact assembly and having a profiled mating section for matable engagement with a profiled mating section of the complementary connector;

mounting means on said shield means having mounting section means and maintaining means; and



latch members having hook members, pressing members, and, slot means in which said mounting section means is disposed;

and cantilever means on said latch members including said maintaining means of said mounting means maintaining the latch members on said mounting section means so that when the pressing members are moved inwardly, said latch members pivot on said mounting section means causing said hook members to move away from the shield means thereby unlatching said hook members from latching members on the complementary connector.

4,961,712

MECHANICAL AND ELECTRICAL CONNECTION BETWEEN AN EXTRUDED METAL PROFILE AND A CAST METAL MEMBER

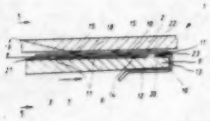
Hans M. Schwenk, Straubenhardt; Hans-Ulrich Günther, Pfinztal, and Michael Joist, Gaggenau, all of Fed. Rep. of Germany, assignors to Schroff GmbH, Straubenhardt, Fed. Rep. of Germany

Filed Oct. 18, 1989, Ser. No. 423,047

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1988, 3835695

Int. Cl.[5] H01R *4/24*

U.S. Cl. 439—436 **17 Claims**



1. A mechanical and electrical connection between an extruded metal profile and a cast metal member, with the cast member being provided with a peg-like projection adapted to the interior configuration of the extruded profile and insertable into the extruded profile, comprising at least one spring having a greater hardness than the extruded profile said cast member being disposed between mutually facing faces of the extruded profile and the projection, said spring including shaped-on barbs which claw into the extruded profile and the projection.

4,961,713

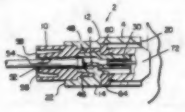
DUAL MOLDED SEALED CONNECTOR WITH INTERNAL GATING

Dennis C. McCracken, Winston-Salem, N.C.; Charles R. Malstrom, Lebanon, Pa., and Peter G. Nielsen, King, N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 22, 1987, Ser. No. 112,572

Int. Cl.[5] H01R *13/40*

U.S. Cl. 439—587 **18 Claims**



1. A sealed electrical connector comprising at least one terminal and insulative body including a relatively rigid terminal housing and a relatively flexible seal, the terminal housing including at least one terminal cavity communicating between a mating face and an opposite terminal housing face, a terminal being disposed in each terminal cavity, and at least one internal seal cavity in the terminal housing communicating between the mating face and the opposite terminal housing face, the seal extending through the internal seal cavity in the terminal housing, an interfacial seal portion engagable with a separate mating connector being formed on the mating face and a conductor seal portion being formed adjacent the opposite terminal housing face by a single seal extending through the seal cavity, the insulative body comprising a unitary dual molded member.

4,961,714

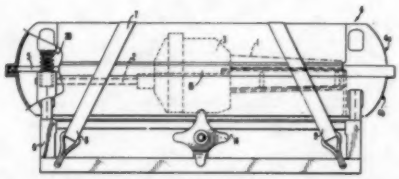
MOUNTING ARRANGEMENT FOR A MARINE RADIO DISTRESS BEACON

David A. Smith, 31 Eastry Ave., Haynes, Bromley, Kent, England

Filed Jun. 9, 1989, Ser. No. 363,986

Int. Cl.[5] B63C *9/22*

U.S. Cl. 441—10 **6 Claims**



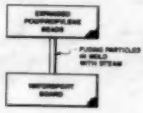
1. A mounting arrangement for a marine radio distress beacon comprising a hollow water-tight protective casing which accomodates the beacon, the casing including the beacon being appreciably bouyant in water and being composed of at least two separable parts and automatic release means effective to separate the parts and release the radio distress beacon when the casing rises to a water surface after being submerged therein.

4,961,715

SURFBOARD CONSTRUCTION

Dennis A. Shanelec, 1515 State St., Santa Barbara, Calif. 93101

Filed Jan. 9, 1989, Ser. No. 294,750
Int. Cl.[5] B29D *27/04*
U.S. Cl. 441—74 7 Claims



1. Improved water sport equipment comprising:

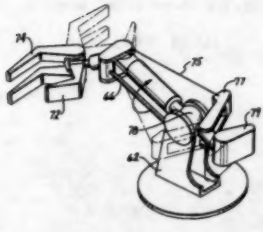
a water sport board composed of expanded polypropylene (foam) beads fused together in a mold under steam pressure to form a water sport board having a density in the range of 1.0 to 5.0 pounds per cubic foot.

4,961,716

TOY APPARATUS INCLUDING ROBOTIC ARM

Keith A. Hippely, Manhattan Beach; Madhusudan Joshi, Palos Verdes Estates, and Larry R. Wood, Redondo Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Feb. 2, 1988, Ser. No. 151,689
Int. Cl.[5] A63H *33/00*
U.S. Cl. 446—75 14 Claims



1. Toy apparatus including a robotic arm for handling toy members, comprising:

a housing;

a track positioned on the housing for defining a predetermined path past a plurality of stations including a pickup station, an immersion station, and an exit station, and

a robotic arm positioned on said housing, said robotic arm having a first elongated member having a major axis and including actuatable gripper members pivotally coupled to the distal end and a control member at the proximal end;

a first pivot including a first universal joint supporting first elongated member to be pivotable on a first axis for vertical movement and rotatable about its major axis; and a second pivot supporting said first elongated member to be pivotable on a second axis for movement in a horizontal plane,

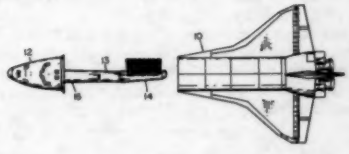
whereby said gripper members can be controlled to pick up a toy member at the pickup station and dip the toy member at the immersion station, and deposit the toy member at the exit station.

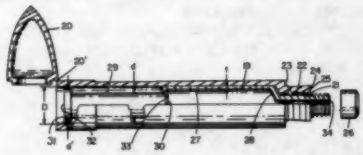
4,961,717

TOY CONTAINING DENTAL CLEANING APPARATUS

Robert C. Hickey, 5701 Katydid La., Austin, Tex. 78744

Filed Jan. 22, 1990, Ser. No. 468,136
Int. Cl.[5] A63H *27/00*; B65D *83/10*; A46B *17/00*
U.S. Cl. 446—76 2 Claims





1. A toy containing dental cleaning apparatus, said toy comprising:

a first hollow component having a removeable, replaceable end,

a second hollow component having first and second ends, said first end being hinged on said component,

said apparatus comprising:

a toothbrush having a brush end and a shaft end, said shaft end being detachably attached to said removable/replaceable end whereby when said removable/replaceable end is replaced said toothbrush is contained in said first hollow component and

a container of dentifrice storable in said second hollow component.

4,961,718

TOY PISTOL WITH A BALL BULLET

Szu-Hua Wu, 1-2, Lane 975, Tsunjih Road, Taoyuan, Taiwan

Filed Feb. 7, 1990, Ser. No. 476,585
Int. Cl.[5] A63H *5/04*, *33/30*; F41B *11/00*; F41C *3/00*
U.S. Cl. 446—406 1 Claim

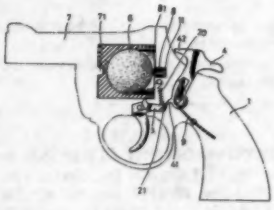
1. A toy pistol with a ball bullet comprising:

a body having on the vertical surface a blind hole in which a spring and a pin are placed in sequence and on the upper end two spring-loaded balls;

a barrel pivoted on said body and being able to be kept in position by the two spring-loaded balls of said body;

a bullet seat being a cylindrical member having threads on one end and a center hole at the other end adapted to receive a protuberance of said barrel such that said bullet seat may be rotated with respect thereto;

a ball bullet coated with safety powder and received in the bullet seat;
a trigger pivoted on said body;
a spring-loaded push rod pivotally connected at one end with said trigger and engaged with one of said threads on said bullet seat; and



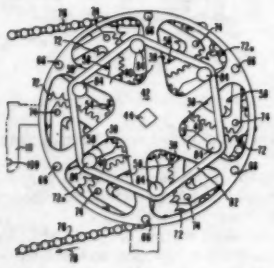
a spring-loaded hammer pivoted on said body and being able to be actuated by said push rod;
whereby when said trigger is pressed, said hammer and said push rod will be actuated to move and when said trigger reaches to the end of the stroke thereof, said hammer will be released to hit said ball bullet thereby producing a cracking noise.

4,961,719

VARIABLE DRIVE TRANSMISSION

Don A. Wildermuth, Verdi, Nev., assignor to Gruber, Kaplan & Associates, San Rafael, Calif.

Filed Jul. 19, 1989, Ser. No. 382,817
Int. Cl.[5] F16H *55/52*
U.S. Cl. 474—50 **50 Claims**



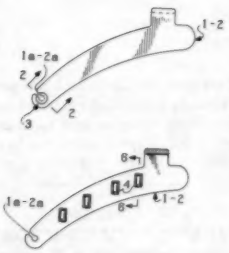
1. Transmission apparatus comprising:
a support;
a crank shaft rotatable about its axis on the support;
a carrier member mounted on the crank shaft for rotation therewith about said axis;
a pair of segments pivotally mounted on the carrier member for movement toward and away from the crank shaft, each segment having a rotatable drive element mounted thereon at a location spaced from said axis, said drive elements being diametrically opposed to each other with reference to said axis;
a gear mounted on the crank shaft for rotation relative thereto, said segments having gear means in mesh with the gear to synchronize the pivotal movements of said segments;
an endless, flexible drive member coupled to the drive elements, the drive elements being pivoted toward the crank shaft as a function of the torque applied to the crank shaft;
means biasing the segments in a direction away from the crank shaft; and
means on the support and spaced from the crank shaft for keeping a portion of the drive member under tension as the crank shaft is rotated.

4,961,720

FRONT DERAILLEUR FOR BICYCLES OR SIMILAR VEHICLES

Henri Juy, Dijon, France, assignor to Simplex S. A., Marsannay La Cote, France

Filed Jun. 21, 1989, Ser. No. 369,216
Claims priority, application France, Jun. 21, 1988, 88 08777
Int. Cl.[5] F16H *7/18*
U.S. Cl. 474—80 **9 Claims**



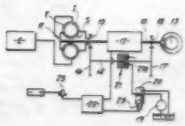
1. A front derailleur for a bicycle having a drive chain and gear plates of varying diameters comprising a bifurcated fork having parallel spaced legs comprising each of said legs having an aligned axial bore therethrough, each of said bores having axially aligned slots, a shaft, said shaft having two axial grooves, said two axial grooves being separated from each other by the dimension of the space of said legs, said slots being dimensioned approximately the diameter of the said shaft at its grooves whereby said shaft is capable of being inserted into said bores through said slots.

4,961,721

VEHICLE DRIVE LINES

John D. Sword, Oxon, and Kenneth Pawson, Altringham, both of England, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands

PCT No. PCT/GB88/00613, § 371 Date Mar. 13, 1989, § 102(e) Date Mar. 13, 1989, PCT Pub. No. WO89/01100, PCT Pub. Date Feb. 9, 1989
PCT Filed Jul. 28, 1988, Ser. No. 327,193
Claims priority, application United Kingdom, Jul. 29, 1987, 8718027
Int. Cl.[5] F16H *47/06*
U.S. Cl. 475—47 **6 Claims**



1. A vehicle having a prime mover (E) which drives a drive shaft (10) via a torque converter (11) and a multi-ratio transmission (12), the vehicle also including an independent drive line (14) connected between the prime mover and the drive shaft (10) independent of the action of the torque converter and multi-ratio transmission (12), the independent drive line

(14) providing an overdrive or underdrive function to extend the drive range provided by the multi-ratio transmission and including clutch means (21) for the engagement of the additional ratio, and an interlock arrangement (22) connected to the multi-ratio transmission (12) to prevent the simultaneous connection of drive to the drive shaft via the multi-ratio transmission (12) and the independent drive line (14).

4,961,722

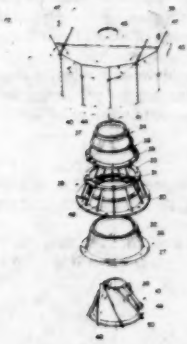
CONICAL SCREEN FOR A VERTICAL CENTRIFUGAL SEPARATOR

Jimmy Taylor, Mt. Gay, W. Va.; David L. Singleton, Poland, Ohio; Stanley A. Skeens, Danville, and Dennis R. Runyon, Logan, both of W. Va., assignors to Guyan Machinery Co., Phico, W. Va.

Filed Nov. 30, 1989, Ser. No. 443,280

Int. Cl.[5] B01D *35/00*; B04B *7/16*

U.S. Cl. 494—36 **29 Claims**



1. In a vertical centrifugal separator comprised of a vertical drive shaft assembly; a frustoconical flight assembly coaxially carried by said drive shaft assembly so that the base of the frustrum is down and the top of the frustrum is up, said flight assembly consisting essentially of a hollow frustrum of a right circular cone that has a plurality of parallel, spiral, hindrance flights attached to the exterior of its lateral wall; a frustoconical screen also carried by said drive shaft assembly and mounted in such a position as to concentrically surround said flight assembly; differential means for causing said flight assembly and said screen to spin in the same direction at different speeds; and a housing that encloses said screen; the IMPROVEMENT wherein the screen is in the configuration of a frustrum of a right circular cone and is divided horizontally into an upper partial screen and a lower partial screen, said partial screens being detachably held together, and the housing has an access door through which the upper partial screen can be detached from the lower partial screen and the rotor, removed from the housing, and replaced with a new partial screen, without removing the housing or the lower partial screen.

4,961,723

CENTRIFUGE DRUM FOR CLARIFYING OR SEPARATING CENTRIFUGATES

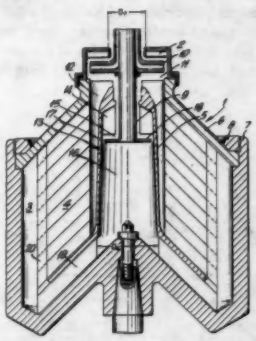
Paul Bruning; Wilfried Mackel, both of Oelde; Ulrich Wrede, Ennigerloh-Ostenfelde, and Willi Niemerg, Oelde, all of Fed. Rep. of Germany, assignors to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Continuation of Ser. No. 85,426, Aug. 14, 1987, abandoned. This application Feb. 6, 1989, Ser. No. 307,191

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1986, 3627826

Int. Cl.[5] B04B *11/00*

U.S. Cl. 494—56 **6 Claims**



1. In a centrifuge drum for clarifying or separating centrifugates, having means forming a separation space, means forming a skimming chamber for receiving liquids from the separation space and having at least one skimmer therein for diverting clarified or separated liquids, means forming an intake space radially within the separation space and which rotates with the drum and includes an intake chamber having a diameter D_K and defined during operation by a liquid surface of liquid not rotating at the same speed as the drum and a vestibule above the intake chamber, a stationary intake pipe extending through the intake space and opening at an outflow end into the intake chamber, means forming channels to provide communication between the intake chamber and the separation space such that a filling of the intake chamber is effective during use, the improvement wherein: the means forming the skimming chamber effects a liquid surface therein having a diameter D_F that must be maintained during operation, the diameter D_K of the intake chamber in the vicinity of the channels is greater than the diameter D_F to produce a choking effect therebetween, and further comprising means forming an annular gap between the vestibule and the intake chamber comprising a disk secured to the intake pipe at said outflow end and having an outer periphery, wherein the annular gap is demarcated by the outer periphery of the disk and an inner surface of the means forming the intake space, and ribs in the vestibule for acting on the liquid therein.

4,961,724

LOW SPEED PARTICLE CONCENTRATORS

Dan R. Pace, Halifax, Canada, assignor to Oceam Marine Technologies Ltd., Halifax, Canada

Filed Sep. 28, 1989, Ser. No. 413,738

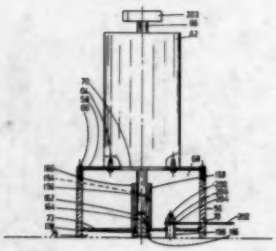
Claims priority, application Canada, Sep. 30, 1988, 579008

Int. Cl.[5] B04B *1/08*

U.S. Cl. 494—68 **15 Claims**

1. A low speed decanting centrifuge assembly for separating particulate matter from a fluid held within a container comprising: a housing; means for mounting said housing on said container; lower bearing support means within said mounting

means and carrying an upwardly and outwardly flaring frustoconical deflector member; an outer cylindrical member extending downwardly from said mounting means; an intermediate cylindrical member extending downwardly from said bearing support means and within said outer cylindrical member; circumferentially spaced apart vane means between said support and mounting means defining a gap therebetween; a lower bowl assembly including an upwardly and outwardly flaring lower bowl member affixed to a lower bearing member, an inner cylindrical member extending downwardly therefrom within said intermediate cylindrical member, and bearing means between said lower bearing member and said lower bearing support for rotatably and bearingly supporting said lower bowl assembly within said housing; a drive motor on top of said housing and having a drive shaft extending downwardly into said housing; a cylindrical transfer tube keyed to said drive shaft and extending further into said housing to



within said lower bowl member; an assembly of upwardly and outwardly flaring vertically spaced apart frustoconical discs attached to the lower end of said transfer tube, said tube having upper discharge port means in an upper discharge chamber of said housing and lower inlet port means between adjacent ones of said discs; an upper bowl member having an outer rim engageable with an outer rim of said lower bowl member and defining a centrifuge chamber with said lower bowl member, said centrifuge chamber enclosing said discs; means adjustably biasing said upper bowl member towards said lower bowl member; and means for admitting a gas under pressure into said housing below said discharge chamber, said pressurized gas being admissable into said container at least through the annular passage defined between said outer and intermediate cylindrical members to pressurize said container and thereby drive fluid from said container into said centrifuge assembly upwardly via said inner cylindrical member.

4,961,725

DEVICE FOR CONTROLLING THE FLOW OF A FLUID AND A PROSTHETIC ORGAN EQUIPPED WITH THIS DEVICE

Pierre Rey, Thorigny; Jacqueline Leandri, Paris, and Clement Abbou, Fontenay-Sous-Bois, all of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Division of Ser. No. 650,496, Sep. 14, 1984, Pat. No. 4,721,095. This application Aug. 21, 1987, Ser. No. 87,919
Claims priority, application France, Sep. 14, 1983, 83 14607
Int. Cl.[5] A61F *2/04*
U.S. Cl. 600—31 **8 Claims**

1. A sphincteral prosthesis, having a duct, in combination with a urinary control device which comprises:

a prosthetic sphincter having wall portions and being made from silicon elastomers and having a plurality of spurs formed on an outer surface thereof for preventing any axial movement thereof, said prosthetic sphincter further comprising:

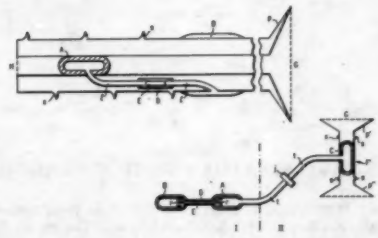
sealing means, located at one end of said prosthetic sphincter; and

a device for controlling urinary flow, wherein said device comprises:

first and second flexible activating bags for controlling urinary flow through said prosthetic sphincter and containing an activating fluid;

a tube connecting said first and second bags wherein said first bag is located in said duct of said prosthetic sphincter;

valve means responsive solely to the pressure of said activating fluid obtained by manual deformation of one of said first and second activating bags, said valve means comprising a valve seat in the form of a rod located inside said



tube, wherein said tube comprises a valve element formed of a flexible plastic material for engaging said rod, said first bag comprises means, upon deflation by manual deformation, for reestablishment of flow of fluid in a duct in said prosthetic sphincter, whereas the second activating bag comprises means, upon deflation by manual deformation, for stopping of flow in said duct; and

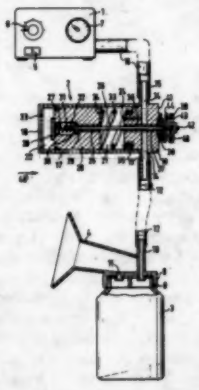
means for preventing said rod from leaving said tube under the effect of said pressure wherein engaging action of said tube and said means for preventing said rod from leaving said tube is overcome solely by said pressure.

4,961,726

BREAST MILK PUMP

Siegfried Richter, Rudolfstrasse 3, D-7798 Pfullendorf, Fed. Rep. of Germany

Filed Dec. 28, 1988, Ser. No. 291,001
Int. Cl.[5] A61M *1/06*
U.S. Cl. 604—74 **14 Claims**



1. A breast milk suction pump arrangement comprising: a suction pump having a suction connection; a funnel breast connector; a reservoir connected to said funnel; and a pulsator, said suction pump being connected to said pulsator by a first

suction line, said reservoir being connected to said pulsator by a second suction line, said pulsator comprising a cylinder, a control element movably positioned in said cylinder and cooperating with said cylinder to define an air chamber and a vacuum chamber, said control element separating said air chamber and said vacuum chamber, said vacuum chamber communicating with said first suction line and communicating with said second suction line, said cylinder defining an opening allowing communication between said air chamber and atmosphere, an air intake valve including an air intake valve opening and a valve closing element, said valve closing element being movable to open and close said valve opening to allow and prevent communication between said vacuum chamber and atmosphere, transmission means connected between said control element and said valve element for opening and closing said valve element upon movement of said control element in an opening and closing direction, said transmission means including delay means for delaying the closing of said valve element upon movement of said control element in a closing direction, whereby said control element moves in an opening direction due to a vacuum generated in said vacuum chamber by said suction pump, thererby providing a pulsating suction action at said funnel breast connector.

4,961,727

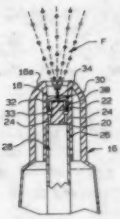
DISPENSING PACKAGE

Walter C. Beard, South St., Middlebury, Conn. 06762

Filed Nov. 16, 1988, Ser. No. 271,718

Int. Cl.[5] A61M *11/00*

U.S. Cl. 604—75 **9 Claims**



9. A dispensing package for liquids to deliver a product in droplet form, comprising a resilient-walled container, a discharge head on the container, the head including an annular outwardly facing recess defining a central post, a button having a circular wall with a central discharge orifice therethrough and being disposed against the top of the post and sealing the recess, the post and circular wall defining between them a swirl chamber having at least one tangential channel leading to the side of a central circular chamber having its axis in line with the orifice, and a dip tube extending down into the container and having its upper end communicating with the channel as the only passage from the container into the head, whereby when the container is squeezed, liquid in the container is driven up the dip tube into the channel to swirl in the swirl chamber in the absence of air and emerge from the orifice in droplet form.

4,961,728

SINGLE-USE SYRINGE HAVING MISUSE RESISTANT FEATURES

Anthony J. Kosinski, New Providence, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Dec. 30, 1988, Ser. No. 292,277

Int. Cl.[5] A61M *5/00*

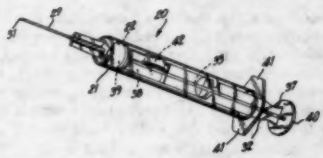
U.S. Cl. 604—110 **23 Claims**

1. A single-use syringe assembly having misuse resistant features comprising:

a barrel having an inside surface describing a chamber for retaining fluid, said barrel having an open barrel end and a distal barrel end having a passageway therethrough in fluid communication with said chamber;

a plunger rod including an elongate body portion having a proximal end and a distal end, and a stopper at said distal end, said stopper being slidably positioned in fluid tight engagement in said barrel, said body portion extending outwardly from said open barrel end; and

a locking element positioned in said barrel between said elongate body portion of said plunger rod and said inside surface of said barrel, said element having a proximal portion and a distal portion, said locking element including at least two adjacent proximally and outwardly facing non-parallel locking barbs, a distally and inwardly facing resisting edge and an inwardly facing driving edge at said



proximal portion of said element, said driving edge adapted to interact with said body portion of said plunger rod to move said locking element along said barrel as said stopper is advanced along said barrel, said resisting edge and said bards adapted to prevent proximal motion of said plunger rod with respect to said barrel after initial distal motion of said stopper to expel fluid through said passageway wherein subsequent proximal motion of said plunger rod with respect to said barrel causes said resisting edge to engage said plunger rod causing said locking element to move in a proximal direction wherein said locking barbs engage said inside surface of said barrel to prevent further movement and allowing only distal movement of said plunger rod with respect to said barrel.

4,961,729

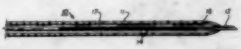
CATHETER INSERTION ASSEMBLY

Vincent L. Vaillancourt, 30A Ridgedale Ave., East Hanover, N.J. 07936

Filed Dec. 13, 1988, Ser. No. 283,602

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—164 **3 Claims**



1. A catheter insertion assembly comprising

an elongated catheter;

a tubular dilator mounted coaxially within said catheter;

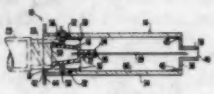
a needle slidably mounted within said dilator and being sized to define an annular flashback chamber therebetween, said needle having a hollow distal end projecting from said dilator for piercing a wall of a vessel and at least one aperture in said needle communicating said hollow distal end with said annular flashback chamber to deliver venous blood thereto; and a wire guide slidably mounted coaxially within said needle for movement from a rest position upstream of said aperture to an extended position downstream of said aperture and projecting from said needle.

4,961,730

HYPODERMIC SYRINGE WITH SLIDING CAP

George W. Poncy, 3725 Investment La., Riviera Beach, Fla. 33404

Filed Sep. 29, 1989, Ser. No. 414,005
Int. Cl.[5] A61M 5/32
U.S. Cl. 604—198 10 Claims



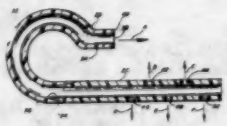
1. A needle and cap assembly for attaching to a hypodermic syringe body comprising a needle, means for mounting said needle, said needle mounting means having means for securing said needle mounting means on the syringe body, a cap slideably mounted on said needle mounting means between a first position in which said cap covers said needle and a second position in which said cap exposes said needle, said needle mounting means having bands making a sliding fit with an interior surface of said cap, and means for selectively locking said cap in said first position, a first structure on said bands and a second structure on an interior surface of said cap, said first structure and said second structure being selectively engageable with one another.

4,961,731

ANGIOGRAPHIC CATHETER WITH BALANCED DYE INJECTION OPENINGS

Raymond O. Bodicky, Oakville; Ronald Crouther, Chesterfield; LeRoy S. Forney, St. Louis, and Andrew Serowski, Ballwin, all of Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Jun. 9, 1988, Ser. No. 204,497
Int. Cl.[5] A61M 25/00
U.S. Cl. 604—264 14 Claims



1. A catheter for performing diagnostic angiography on a patient comprising:

a long flexible tubular portion; and

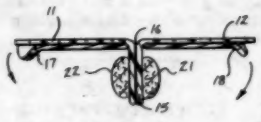
a flexible tubular end portion on one end of the long portion end portion having a first inner diameter and comprising a curved portion and a distal tip portion at an end thereof having an opening therein for passage of a first stream of fluid under pressure therethrough, the open end of the distal tip facing back in the direction of the catheter and generally parallel to the catheter, the tip opening being positioned so that the first stream exits the tip portion spaced away from and in a direction generally parallel to the long portion, the long portion having a second inner diameter wherein said second inner diameter is larger than said first inner diameter of said end portion and a plurality of openings therein for passages of e corresponding plurality of streams of fluid under pressure therethrough, the size and location and spacing of each one of said plurality of openings being preselected so as to provide dynamic stability of the end portion when the first and plurality of fluid streams pass through their respective openings, and so as to substantially minimize the potential for causing undesired heart beat patterns and undesired fluid flow patterns.

4,961,732

ATHLETE'S FOOT BANDAGE

Christopher J. Stienstra, Box 899 (Monroe St.), E. Douglas, Mass. 01516

Filed Feb. 13, 1989, Ser. No. 309,492
Int. Cl.[5] A61M 35/00
U.S. Cl. 604—293 2 Claims



1. A bandage particularly for the application of an anti-fungal medication to confronting surfaces of adjacent toes of a foot comprising,

a first elongate upper leg secured adjacent a second elongate upper leg, and

a first downwardly extending lower leg contiguously secured to and coextensive with an adjacent second downwardly extending leg, and

said first elongate upper leg joined to said first downwardly extending lower leg at a first junction, and said second elongate upper leg joined to said second downwardly extending lower leg at a second junction, and

a first medicated pad secured to an exterior surface of said first leg, and

a second medicated pad secured to an exterior surface of said second leg wherein said medicated pads are oriented for application of said anti-fungal medication to said surfaces, and

wherein said first elongate upper leg is secured in a mirror image orientation adjacent said second elongate upper leg with said first and second junctions secured adjacent one another, and

wherein said first downwardly extending lower leg is secured to said second downwardly extending lower leg at interior surfaces of said first and second downwardly extending lower legs with an adhesive to secure said first and said second downwardly extending lower legs together, and

wherein a first removable strip is secured to an interior surface of said first elongate upper leg extending between a distal end of said first elongate upper leg to said first junction, and a second peel-away removable strip secured to an interior surface of said second elongate upper leg and extending between a forward end of said second elongate upper leg and said second junction, and

wherein said first pad is secured to said exterior surface of said first leg above and spaced from a lowermost edge of said first downwardly extending lower leg and spaced below said first junction, and said second medicated pad secured to said exterior surface of said downwardly extending lower leg spaced a distance from a lower edge of said second downwardly extending lower leg and spaced below said second junction, and

wherein said bandage is of a "T" shaped configuration.

4,961,733

FOOT CLEANING AND CHEMICAL APPLICATION APPARATUS

Peter M. Joseph; Thomas G. Michalek, both of Pittsburgh, and Mylan Gruber, Monaca, all of Pa., assignors to Dr. Joseph's Foot Products, Inc., Pittsburgh, Pa.

Filed Jul. 1, 1988, Ser. No. 214,447
Int. Cl.[5] A61M *35/00*; A47K *7/04*
U.S. Cl. 604—293 **5 Claims**

1. Apparatus for cleaning or applying chemicals to a foot of a person comprising:

a generally elongated handle having two ends and having a length approximately equal to the distance between the person's knee and foot;

one end of the handle being adapted to be held by a hand of the person;

an opposite end of the handle including means for releasably securing hereto a connector means carrying an absorbent material of a size and shape to be received between the toes of the person;

said securing means including a pair of spaced members in a first plane extending the length of the handle and a member in a second plane parallel to and laterally displaced from said first plane to provide an opening between the members in the respective planes; and

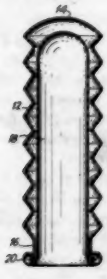
said connector means having two ends, one end adapted to be inserted into said opening with opposed surfaces of said end frictionally engaging said members and locking means on the opposed surfaces of said end for engaging at least one of said spaced members to secure the connector to the handle, the absorbent material being attached to an opposite end of said connector means.

4,961,734

CONDOM APPLICATOR AND PACKAGING

Leon B. Kassman, 208 W. 29th St., New York, N.Y. 10001

Filed Jun. 10, 1988, Ser. No. 206,182
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604—349 **4 Claims**



1. In combination, a condom and an applicator therefore;

said applicator being comprised of a closed-ended tubular member having a accordion pleated axial wall of buttressed tooth form which is resistive to axial contraction subsequent to axial expansion thereof, and, a ring-shaped flange at the open end of said applicator;

said condom having a major portion including its closed axial-end contained within said applicator, and having the remaining portion of its length rolled and expanded over said ring-shaped flange to provide a hermetic seal therewith;

said major portion of said condom being positioned in at least close proximity with the interior of said collapsed applicator;

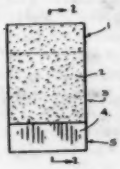
whereby, upon axial expansion of said applicator, said condom will be expanded outwardly and inflated into substantial conformity with the inner wall of said axially expanded applicator.

4,961,735

METHOD FOR DRAINING AND DRYING BODY FLUIDS

Anthony A. Siciliano, Ardsley, N.Y., assignor to Evaporating Apparel Industries, Saddle River, N.J.

Filed Apr. 29, 1988, Ser. No. 188,435
Int. Cl.[5] A61F *13/16*; A61L *15/00*
U.S. Cl. 604—378 **9 Claims**



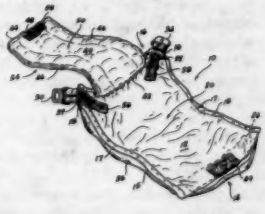
1. A method of containing fluids emanating from the human body using an evaporative bandage, comprising contacting the location on the body from which said fluids are emanating with a bandage, said bandage comprising a first layer made of a moisture-absorbent material and a second layer made of a non-moisture absorbent material; said first and second layers having top and bottom edge portions which are aligned and secured in staggered positions relative to each other so that at one end, said first layer top edge portion extends beyond the second layer top edge portion thereof and is in contact with the location on the body from which said fluids are emanating, and, correspondingly, said second layer bottom edge portion extends beyond the said first layer bottom edge portion at the other end thereof, there being a resulting area wherein a portion of the surface of the lower portion of said first layer is in direct contact with a portion of the surface of the upper portion of said second layer.

4,961,736

REUSABLE DIAPER WITH DETACHABLE LINER

Debra S. McCloud, Edmonds, Wash., assignor to A Better World Company, Edmonds, Wash.

Filed Mar. 2, 1990, Ser. No. 487,642
Int. Cl.[5] A61F *13/15, 13/20*
U.S. Cl. 604—385.1 **19 Claims**



1. A reusable diaper comprising:

a panel having a front end, a back end, an inner surface and an outer surface;

tab means extending outward from each side of the back end, the tab means having an inner surface and an outer surface;

fastener means on the inner surface of each tab means and on the outer surface of the front end;

an absorbent liner having a fixed edge permanently attached to one end of the panel, a detachable edge opposite the fixed edge, two sides unattached to the panel, an exposed surface nominally facing away from the panel and an unexposed surface nominally facing toward the panel; and

detachable coupling means on the unexposed surface of the liner adjacent the detachable edge thereof and on the inner surface of the panel for detachably coupling the detachable edge of the liner to the panel.

4,961,737

THERAPEUTIC DIAPER

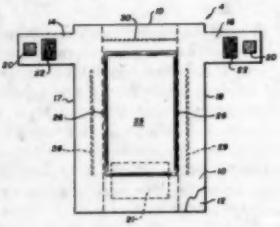
Ramon A. Orlando, Vancouver, Canada, assignor to University of British Columbia, Vancouver, Canada

Continuation-in-part of Ser. No. 203,537, May 23, 1988, abandoned, which is a continuation of Ser. No. 56,095, May 29, 1987, abandoned. This application Oct. 28, 1988, Ser. No. 264,236

Claims priority, application Canada, Apr. 14, 1987, 534715

Int. Cl.[5] A61F *13/16*

U.S. Cl. 604—385.2 **2 Claims**



1. A diaper comprising:

an essentially rectangular panel of flexible material having an outer layer and an inner layer to define an internal pocket;

fastening means comprising flexible arms extending outwardly from opposite longer sides of said panel adjacent a shorter edge, each of said arms having an engagement means comprising hook and loop fasteners for releasably engaging a single corresponding engagement means centrally located on the outer layer of said rectangular panel;

combined padding and absorbent means comprising needle punch located in said internal pocket by stitching to the outer layer of said rectangular panel such that the stitching does not come into contact with the wearer's skin, said combined means being of an initial width and thickness to ensure that the wearer of the diaper is maintained in the lithotomy position or an approximation thereof by said combined padding and absorbent means bearing on the inner faces of the infant's thighs;

elastic means located parallel and adjacent the longer sides of said rectangular panel to seal said panel about the legs of the wearer and to prevent slippage of said diaper;

elastic means extending parallel and adjacent said shorter edge between said outwardly extending arms of said fastening means;

said diaper being positioned on the wearer such that the essentially rectangular panel of flexible material extends from the wearer's waist, down under the crotch and back up to the waist with said inner layer lying against the skin, said flexible arms of said fastening means extending from the back of the wearer about the waist and diagonally downwardly for engagement with said single centrally located engagement means at the front of the wearer.

4,961,738

ANGIOPLASTY CATHETER WITH ILLUMINATION AND VISUALIZATION WITHIN ANGIOPLASTY BALLOON

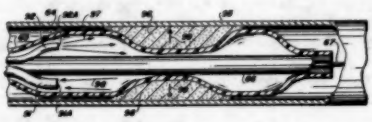
Robert A. Mackin, 329 W. Granada Ave., Phoenix, Ariz. 85003

Continuation-in-part of Ser. No. 8,276, Jan. 28, 1987, Pat. No. 4,784,133. This application Dec. 2, 1987, Ser. No. 127,923

The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.

Int. Cl.[5] A61B *17/36*

U.S. Cl. 606—15 **13 Claims**



1. Angioplasty apparatus comprising in combination:

(a) an elongated, flexible, transparent balloon having a proximal end with a first opening therein and a distal end with a second opening therein;

(b) an outer tube having a proximal end, and a distal end connected in sealed relationship to the proximal end of the balloon so that the first opening opens into the outer tube;

(c) a flexible, semi-rigid inner catheter having a proximal end and a distal end, the inner catheter extending through the outer tube, into the first opening of the balloon, and out of the second opening of the balloon, a portion of the distal end of the balloon around the second opening being attached in sealed relationship to an outer surface of the inner catheter;

(d) means for pumping fluid through a passage between the outer tube and the inner catheter to inflate the balloon;

(e) means extending through the outer tube into the proximal end of the balloon for illuminating material on site, adjacent to the balloon, the illuminating means including an optical fiber having a distal end portion inside the balloon of the proximal end thereof, a midportion extending through the first opening and the outer tube, and a proximal end portion diverging from the outer tube and connected to a light source; and

(f) means extending through the outer tube into the proximal end of the balloon for visualizing the illuminated material, the visualizing means including optical fiber means having a distal end portion generally symmetrically arranged around the inner catheter to allow visualization of a 360 degree band of an inner surface of a blood vessel artery and having a proximal end portion connected to an eyepiece, a midportion extending through the outer tube and the first opening just into the proximal end of the balloon, and a distal end portion overted to view the interior of the artery and the obstruction;

whereby a physician can generally symmetrically visualize the condition of the interior of the artery and the configuration of an obstruction therein before and/or during and/or after dilating the artery by inflating the balloon despite the presence of the inner catheter.

4,961,739

WAVEFORM GENERATOR FOR ELECTROSURGICAL APPARATUS

Richard K. Thompson, Aurora, Colo., assignor to Aspen Labatories, Inc., Greenwood Village, Colo.

Filed Mar. 7, 1988, Ser. No. 165,143
Int. Cl.[5] A61B *17/39*
U.S. Cl. 606—37 7 Claims

1. A waveform generator for controlling the waveform and power output of electrosurgical apparatus, said waveform generator comprising:

a clock for providing a REFERENCE FREQUENCY signal,

a counter responsive to said REFERENCE FREQUENCY signal that counts to a selected number and then provides a SHIFT REGISTER LOAD signal,

an address counter responsive to a N BITS OF THE WAVEFORM signal and to said SHIFT REGISTER LOAD signal, said address counter providing a COUNTER LOAD signal and a SUBADDRESS signal for selecting each N bit word,

an MxNxP storage means for storing waveforms where M is the maximum number of a plurality of different waveforms being stored, each waveform having a maximum length of N times P, N equals the number of a plurality of bits being output in parallel from the storage means at a time and P is the maximum number of a plurality of N bits stored for each waveform, said storage means having input address lines for selecting each waveform and a plurality of parallel output lines for providing a N bits of the waveform at a time, and

said address counter having a counter modulus, said counter modulus being set by preloading a selected count from said storage means which selected count provides a waveform of a selected repetition frequency over a range of frequencies, reading a full count and counting to zero, as upper bit of said address counter going to zero and reloading the preloaded count,

a parallel to serial shift register loaded by the N bits of the waveform in response to said SHIFT REGISTER LOAD signal, said COUNTER LOAD signal, and said REFERENCE FREQUENCY signal for converting the N bits of the waveform to a SINGLE BIT SERIAL WAVEFORM output signal for controlling power output, said output signal being selected by said SUBADDRESS signal at a speed determined by said REFERENCE FREQUENCY signal, said output signal having a maximum bit output time N times faster than the read access time of said storage means.

4,961,740

V-THREAD FUSION CAGE AND METHOD OF FUSING A BONE JOINT

Charles D. Ray, Deephaven, and Eugene A. Dickhudt, New Brighton, both of Minn., assignors to Surgical Dynamics, Inc., Alameda, Calif.

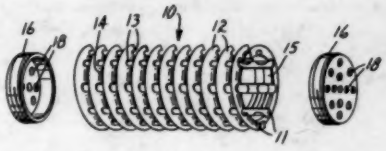
Filed Oct. 17, 1988, Ser. No. 259,031
Int. Cl.[5] A61F *5/04, 2/28*
U.S. Cl. 606—61 34 Claims

1. A fusion cage adapted for promoting fusion with one or more bone structures when bone-growth-inducting substance is packed into the fusion cage, comprising:

a cage body defining an internal cavity adapted to be packed with the bone-growth-inducing substance, which cage body defining an outer surface;

means defined on the outer surface of the cage body for mating the fusion cage to the bone structure, which means prevents the fusion cage from backing out from the bone structure;

means for providing immediate contact between the one or



more bone structures and the bone-growth-inducing substance packed into the fusion cage when the fusion cage is mated to the one or more bone structures so that the one or more bone structures cross over the outer surface into the internal cavity and into contact with the bone-growth-inducing substance packed in the fusion cage, and the bone-growth-inducing substance packed in the fusion cage.

4,961,741

SUTURE KNOTTING INSTRUMENT

John O. Hayhurst, 14751 SE. Wanda Dr., Milwaukie, Oreg. 97267

Filed Jan. 8, 1990, Ser. No. 461,621
Int. Cl.[5] A61B *17/00;* D03J *3/00*
U.S. Cl. 606—139 14 Claims

1. A device for forming knots, comprising:

a leading member configured to receive first and second sutures and being slidable along those sutures; and

a trailing member configured to receive the first and second sutures and being slidable along those sutures, the leading member and trailing member including guide means for fixing the position of a first knot in the sutures while moving a second knot in the sutures.

4,961,742

SUTURE NEEDLE HOLDING INSTRUMENT

Randall J. Torre, 842 S. Clover, San Jose, Calif. 95128

Filed Mar. 24, 1989, Ser. No. 328,491
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—147 18 Claims

1. Apparatus for gripping and holding a suture needle for use during surgical procedures comprising:

first and second elongated members;

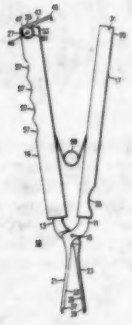
each of said first and second elongated members having a generally straight handle portion fixedly attached at one end thereof and a jaw at the other end thereof, said handle portions being adjacent and disposed parallel to one another when said jaws are in a closed configuration, said handle portions fabricated of aluminum;

pivot means pivotally interconnecting said first and second elongated members intermediate the ends thereof;

a transverse groove formed in a facing surface of each jaw

near the end of each jaw, said facing surface of each jaw in opposing relationship with the facing surface of the other jaw, said grooves for receiving a suture needle and securely gripping said suture needle in said jaws when said jaws are in a closed configuration;

locking means including a locking clip pivotally attached at the end of one of said handle portions, said locking clip adapted to engage a clip catch formed in the end of the other one of said handle portions, said locking means for releasable coupling said handle portions together, said



jaws in an open configuration when said locking means is disengaged and said jaws in a closed configuration when said locking means is engaged; and

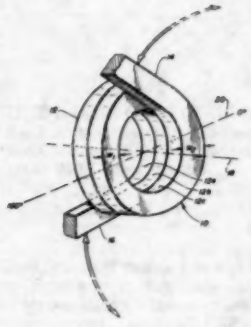
one of said handle portions including a recessed area on the outside aspect of said handle portion near said pivot means, said recessed area contoured to approximately accommodate a human thumb and the other one of said handle portions including a plurality of indented areas on the outside aspect of said other handle jportion, each of said plurality of indented areas contoured to approximately accommodate human fingers.

4,961,743

TORSION SPRING

George Kees, Jr., Alexandria, Ky.; Charles B. Worrick, III, Hanson, and John A. Santangelo, East Freetown, both of Mass., assignors to Codman & Shurtleff, Inc., Randolph, Mass.

Filed Jan. 3, 1989, Ser. No. 292,986
Int. Cl.[5] A61B *17/08*
U.S. Cl. 606—158 **9 Claims**



1. A torsion spring comprising:

a coil portion;

said coil portion having first and second extensions extending from said coil portion and offset to one side of said coil portion to provide means for applying force to said torsion spring; and,

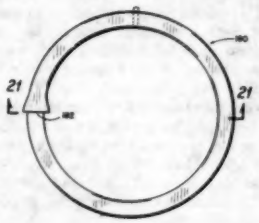
means for providing substantially balanced stresses around said coil portion when torque is applied to said torsion spring including a non-uniform cross-section for said coil portion said coil portion having a largest cross-section at a point on said coil portion most removed from said one side and a smallest cross-section at a point on said coil portion closest to said one side.

4,961,744

HOLDER FOR INSERTING CORNEAL CURVATURE ADJUSTABLE RING

Lauren G. Kilmer, and Alvin E. Reynolds, both of Tulsa, Okla., assignors to Keravision, Inc., Santa Clara, Calif.

Continuation of Ser. No. 62,790, Jun. 15, 1987, abandoned, which is a continuation-in-part of Ser. No. 336,919, Jan. 4, 1982, Pat. No. 4,452,235, and a continuation-in-part of Ser. No. 579,480, Feb. 13, 1984, Pat. No. 4,671,276, and a continuation-in-part of Ser. No. 10,400, Feb. 3, 1987, Pat. No. 4,766,895. This application May 26, 1989, Ser. No. 357,700
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—166 **13 Claims**



1. Apparatus to adjust the curvature of the cornea of an eye, comprising,

a corneal curvature adjustment ring, said adjustment ring being substantially flat in cross-section and preformed such that said ring is sloped at an angle N which substantially corresponds to the slope of the anterior of said cornea, said adjustment ring includes a forward end and a trailing end, means on said forward end to dissect a circular pathway in said cornea for the receipt of said adjustment ring, and means on said adjustment ring to adjust and maintain the distance between said forward and trailing ends;

a drive ring, said drive ring being pre-formed as a flat wire edge coiled helix wherein the coil is sloped at said angle N, the interior edge of the drive ring having means to releasably interconnect with said adjustment ring;

a cylindrical holder, means at the bottom of said holder to retain one end of said drive ring, and

means to releasably interconnect the other free end of said drive ring with said adjustment ring.

4,961,745

INTRAOCULAR LENS

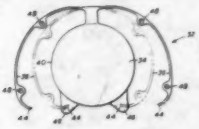
William M. Graham, Vashon, Wash., assignor to Nestle S.A., Vevey, Switzerland

Filed Apr. 17, 1989, Ser. No. 338,611
Int. Cl.[5] A61F *2/16*
U.S. Cl. 623—6 **6 Claims**

1. An intraocular lens for replacing the natural lens of an eye, comprising:

(a) an optically-clear optic portion having a peripheral edge and first and second perpendicular axes normal to the peripheral edge;

(b) a pair of flexible loops connected to a connection tab connected to and projecting outwardly from the optic portion on one side of the first axis, adapted for supporting the IOL in the eye, the loops including outer end portions that terminate outwardly from the peripheral edge and on opposite sides of the second axis;



(c) stabilizer means connected to and projecting from the optic portion on the other side of the first axis from where the loops are connected, adapted for stabilizing the IOL in the eye; and

(d) the flexible loops and stabilizing means being shaped and dimensioned so that when the loops are moved toward the peripheral edge the outer end portions do not extend beyond the stabilizing means.

4,961,746

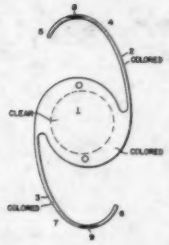
INTRAOCULAR LENS WITH COLORED LEGS AND METHOD OF MAKING

Draboslav Lim, San Diego, Calif.; Stephen Jacoby, Belleair, Fla.; Richard Homick, San Diego, Calif., and Frank Powers, Clearwater, Fla., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 85,662, Aug. 5, 1987, abandoned, which is a continuation of Ser. No. 768,902, Aug. 23, 1985, Pat. No. 4,687,485. This application Aug. 11, 1988, Ser. No. 231,116

Int. Cl.[5] A61F *2/16*

U.S. Cl. 623—6 **23 Claims**



1. An intraocular lens adapted for implantation in the anterior chamber of the eye, comprising a lens body and leg means, formed with said lens body and comprising a plurality of legs, for centering said lens body in said chamber, wherein said legs are polymerized to said lens body and are colored and at least a portion of said lens body is clear, the colored portions of said legs and lens body being colored before polymerization to the lens body.

4,961,747

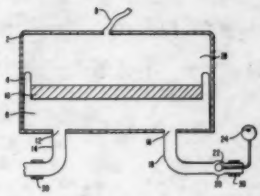
IMPLANTABLE ARTICIFICAL BLADDER SYSTEM

Uwe Wascher, Lenox, Mass.; Jacek L. Mostwin, Baltimore, Md.; Lorne Belden, Jr., and Gerald Kushner, both of Louisville, Ky., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 5, 1988, Ser. No. 279,600

Int. Cl.[5] A61F *2/04*

U.S. Cl. 623—12 **19 Claims**



1. An implantable artificial bladder for the collection of, the storage of, or the discharge of biological fluids comprising:

(i) a leak-proof rigid outer shell comprised of a biocompatible material or a material having a surface coating of a biocompatible material;

(ii) a rolling diaphragm inside said outer shell and attached to the inner surface of said outer shell, dividing the interior space of said outer shell into a leak-proof inner chamber and an outer chamber, said rolling diaphragm being deformable between two positions during introduction and discharge of biological fluid, the first said position corresponding to the full storage volume of implantable artificial bladder and the second said position corresponding to the empty volume of said implantable artificial bladder;

(iii) an external vent in communication with said outer chamber;

(iv) a constant force stored energy means operating on said rolling diaphragm and biasing it against said inner chamber;

(v) at least one inlet conduit in open communication with said inner chamber and adapted to connect to at least one ureter of a patient, or to an artificial ureter, or to a Y-shaped nozzle adapted to connect to both ureters of a patient;

(vi) at least one outlet conduit in open communication with said inner chamber below said rolling diaphragm and adapted to connect to the urethra of a patient or to an artificial urethra; and

(vii) means downstream of said inner chamber for controlling the rate of flow of biological fluid exiting said inner chamber.

4,961,748

SLEEVE FOR AN ACETABULUM

Otto Frey, Winterthur, and Rudolf Koch, Berlingen, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 11, 1989, Ser. No. 393,556

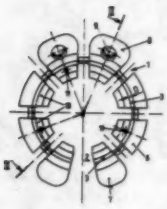
Claims priority, application Switzerland, Aug. 24, 1988, 3145/88-3

Int. Cl.[5] A61P *2/34*

U.S. Cl. 623—22 **16 Claims**

1. A metal sleeve for an acetabulum having a frustum-shaped shell with a slot extending on one side from a base end to an apex end thereof and splitting said shell, said shell having a plurality of peripheral first zones of relatively large wall thickness and second zones of relatively small wall thickness alternating circumferentially about said shell, each second zone of

relatively small wall thickness having an elongated annular sector and a transition portion at each end of said sector merg-



ing on a radius into an adjacent first zone of relatively large wall thickness.

4,961,749

PROCESS FOR REMOVING PERMANGANATE STAINS FROM ARTICLES

James L. Clements, Henderson, Ky., assignor to P.B. & S. Chemical Company, Inc., Henderson, Ky.

Filed Aug. 1, 1989, Ser. No. 387,899
Int. Cl.[5] D06L *3/06*
U.S. Cl. 8—109 10 Claims

1. A bleaching process comprising the steps of:

(a) treating a fiber, a fabric or garment with a permanganate bleaching agent; and

(b) reducing the permanganate with a reducing composition containing sulfur dioxide and ammonia at a weight percent ratio in the range of about 3.1:1 to about 3.65:1.

4,961,750

ACRYLATE TANNING AGENT

Juergen Christner, Bickenbach; Ernst Pfleiderer, Darmstadt-Arheilgen; Tilman Taeger, Seeheim-Jugenheim, and Gertrud Wick, Darmstadt, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Jul. 25, 1988, Ser. No. 223,794
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1987, 3724807
Int. Cl.[5] C14C *3/22*
U.S. Cl. 8—94.27 14 Claims

1. A water soluble tanning agent comprising a complex formed between chromium ion and an acrylate polymer having a molecular weight between 200 and 30,000 and comprising the same or different repeating units of the formula

wherein r_1 is selected from the group consisting of hydrogen, methyl, or $—CH_2COOR_2$ wherein R_2 is hydrogen or alkyl having from 1 to 22 carbon atoms, and Q is selected from the group consisting of (a) cyano, (b) —COOM wherein M is hydrogen, ammonium, an alkali metal, an alkaline earth metal, or of chromium, and (c) $—CONR_3R_4$ wherein R_3 and R_4, taken alone, are independently hydrogen or alkyl having from 1 to 6 carbon atoms or, taken together with the nitrogen atom to which they are bound and together with a further nitrogen, oxygen, or sulfur atom, form a heterocycle, said polymer further comprising between 5 and 60 percent by weight of groups of the formula

wherein R_7 is alkyl or cycloalkyl having 2 to 18 carbon atoms, or is such alkyl or cycloalkyl substituted by hydroxy, or is $—(CH_2)_n—NR''_3R''_4$ wherein n is an integer from 2 to 6 and R''_3 and R''_4, taken alone, are independently hydrogen or alkyl having from 1 to 6 carbon atoms or, taken together with the nitrogen atom to which they are bound and together with a further nitrogen, oxygen, or sulfur atom, form a heterocycle, or is $—R_8COOR_9$ wherein R_8 is alkylene having 2 to 6 carbon atoms and R_9 is hydrogen or alkyl having 1 to 6 carbon atoms, or is such an $—R_8COOR_9$ group comprising a further $—COOR_9$ substituent.

4,961,751

METHOD OF BLEACHING DYED COTTON GARMENTS

Ernest M. Eissele, Holland, Pa.; Edward S. Rogers, Princeton, and Arno H. Reidies, LaSalle, both of Ill., assignors to Carus Corporation, LaSalle, Ill.

Filed Apr. 29, 1988, Ser. No. 188,419
Int. Cl.[5] D06L *3/02*
U.S. Cl. 8—111 12 Claims

1. The method of bleaching dyed, oxidizing agent-bleachable cotton garments, comprising tumbling said garments in damp condition with reuseable preformed solid pellets of limited porosity comprising a substantially water-insoluble abradable aggregate material formed from a self-curing mineral cement or from a mineral filler and a binder therefor, said pellets containing a finely-divided particulate oxidizing bleaching agent embedded in and surrounded by said aggregate material, the surfaces of said pellets wearing away to gradually release the bleaching agent as the pellets are tumbled with the garments.

4,961,752

SEQUENTIAL OXIDATIVE AND REDUCTIVE BLEACHING IN A MULTICOMPONENT SINGLE LIQUOR SYSTEM

Mustafa Arifoglu, Wyndmoor, and William N. Marmer, Ft. Washington, both of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 19, 1989, Ser. No. 299,174
Int. Cl.[5] D06L *3/02, 3/04*
U.S. Cl. 8—111 18 Claims

1. A process for oxidative and reductive bleaching of fibers comprising:

contacting fibers with hydrogen peroxide under conditions which provide oxidative bleaching of said fibers to produce bleached fibers in contact with unspent hydrogen peroxide;

adding to said bleached fibers in contact with unspent hydrogen peroxide, an inactivating material in an amount at least sufficient to inactivate all of said unspent hydrogen peroxide to form an inactivated media; and

subsequent to said inactivation of all said unspent hydrogen peroxide, reductively bleaching said bleached fibers by addition of a reductive bleaching agent to said inactivated media.

4,961,753

COMPOSITIONS AND PROCESS FOR THE TREATMENT OF TEXTILES

Annemieke C. M. Donkers, Kessel-Lo, and George C. Sawicki, Rixensart, both of Belgium, assignors to Dow Corning Limited, Barry, Wales

Filed Jul. 24, 1989, Ser. No. 383,692
Claims priority, application United Kingdom, Jul. 28, 1988, 8817961
Int. Cl.[5] D06M *15/00, 15/66*
U.S. Cl. 8—115.65 7 Claims

1. An aqueous composition for the treatment of textiles which comprises water having dispersed therein (A) a cationic compound which is substantive to water rinse on textile fabrics and (B) a mixture comprising (i) from 5 to 30% by weight of a polydiorganosiloxane having a viscosity of at least 300 Pa.s at 25° C. and wherein at least 80 percent of the total organic substituents are methyl groups, any remaining substituents being monovalent hydrocarbon groups having from 2 to 6 inclusive carbon atoms, and (ii) from 95 to 70 percent by weight of a liquid methyl siloxane having from 2 to 8 inclusive silicon atoms in the molecule, wherein the relative proportions of (A) and (B) are present from 1 to 50 parts by weight o the cationic compound (A) per part by weight of (B) and wherein (A) and (B) are present in a total amount of from 5 to 35 percent by weight based on the aqueous total weight of the aqueous composition.

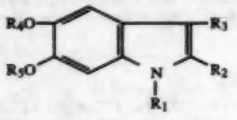
4,961,754

ULTRAFINE INORGANIC POWDER CONTAINING MELANIN PIGMENTS, PROCESS FOR PREPARATION THEREOF AND ITS USE IN COSMETICS

Jean F. Grollier, Paris, France, assignor to L'Oreal, Paris, France

Filed Jul. 18, 1988, Ser. No. 220,264
Claims priority, application Luxembourg, Jul. 17, 1987, 86946
Int. Cl.[5] A61K *7/13, 7/035*
U.S. Cl. 8—423 11 Claims

1. A powder consisting of inert inorganic particles having a particle size ranging from 0.01 to 20 microns, said particles containing on their surface a melanin pigment resulting from the oxidation of at least one indole dye having the formula



(I)

wherein

R_1 represents hydrogen, alkyl having 1–6 carbon atoms or —$SiR_9R_{10}R_{11}$,

R_2 and R_3, each independently, represent hydrogen, alkyl having 1–6 carbon atoms, carboxyl, alkoxy carbonyl wherein the alkoxy moiety has 1–6 carbon atoms or —COO-$SiR_9R_{10}R_{11}$,

R_4 and R_5, each independently, represent hydrogen, linear or branched C_1–C_{20} alkyl, formyl, linear or branched C_2–C_{20} acyl, linear or branched C_3–C_{20} alkenyl, —$SiR_9R_{10}R_{11}$, —P(O) $(OR_6)_2$ or R_6OSO_2,

or R_4 and R_5, together with the oxygen atoms to which they are attached, form a ring containing a carbonyl group, a methylene group, a thiocarbonyl group, a >P(O)OR_6 group or a >CR_7R_8 group,

R_6 and R_7 represent hydrogen or alkyl having 1–6 carbon atoms,

R_8 represents alkoxy having 1–6 carbon atoms or mono- or dialkyl amino,

R_9, R_{10} and R_{11}, each independently, represent linear or branched C_1–C_6 alkyl, and

the addition salt thereof with an inorganic or organic acid, or the corresponding salt of an alkali metal, an alkaline earth metal or an amine.

4,961,755

COATED ACTIVE SUBSTANCES: DYE COATED WITH POLYETHYLENE OXIDE-PROPYLENE OXIDE OR WITH ETHOXYLATED STEARYLDI PHENYLOXYETHYL DIETHYLENETRIAMINE

Beat Bruttel, Böckten, and Petr Kvita, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 19, 1988, Ser. No. 286,547
Claims priority, application Switzerland, Dec. 29, 1987, 5092/87
Int. Cl.[5] C09B *67/02;* C11D *3/39;* D06L *3/12;* B01J *2/30*
U.S. Cl. 8—526 11 Claims

1. A coated active substance comprising at least one dye, in conjunction with optional extenders, dispersants, buffers, stabilizers and/or other auxiliaries, and a coating material wherein the coating material is a substance or mixture of substances which has a melting point of over 40° C. and dissolves or disperses rapidly in water in the temperature range from 10° to 30° C. and/or melts in the temperature range from 40° to 130° C. which coating material comprises a block copolymer of ethylene oxide and propylene oxide or an ethoxylated stearyldiphenyl-oxyethyl diethylenetriamine.

4,961,756

FLUIDIZED-BED COMBUSTION FUEL

John W. Rich, Jr., R.D. #1, Box 211, Auburn, Pa. 17922

Filed Dec. 1, 1988, Ser. No. 278,676
Int. Cl.[5] C10L *5/00, 11/00*
U.S. Cl. 44—605 8 Claims

1. A process for producing from a solid carbonaceous refuse a high ash fuel for use in a circulating fluidized-bed combustion chamber, comprising the steps of:

separating from the refuse a carbonaceous portion having an ash content in a selected range percent by weight;

separating the carbonaceous portion into first and second fractions, the first fraction being at or above a selected size;

crushing the first fraction; and

combining the crushed first fraction with said second fraction.

2. A process according to claim 1 wherein the selected ash content range is between about 30 percent and about 50 percent, by weight.

3. A process according t claim 1 wherein the selected size is above about ¼ inch.

4,961,757

REINFORCED CERAMIC CUTTING TOOLS

James F. Rhodes, Greer; Chester J. Dziedzic, Greenville, and Ronald L. Beatty, Greer, all of S.C., assignors to Advanced Composite Materials Corporation, Greer, S.C.

Continuation of Ser. No. 204,236, Jun. 9, 1988, abandoned, which is a continuation of Ser. No. 161,410, Feb. 23, 1988, Pat. No. 4,789,277, which is a continuation of Ser. No. 830,773, Feb. 18, 1986, abandoned, which is a continuation-in-part of Ser. No. 711,695, Mar. 14, 1985, abandoned. This application Oct. 26, 1989, Ser. No. 426,540
Int. Cl.[5] B24D *3/34*
U.S. Cl. 51—309 14 Claims

12. A sintered cutting tool comprising a cutting edge for metal and consisting essentially of: a matrix consisting essentially of alumina; and silicon carbide whiskers in amounts of 2–40 volume percent thoroughly distributed through said matrix, said cutting tool being made by a process comprising:

thoroughly blending said alumina matrix material in powdered form with said silicon carbide whiskers;

pressing the blended alumna matrix and whiskers at a pressure within a range from about 3,000–60,000 psi into a shape having at least one edge;

sintering the pressed blend of alumina matrix and whiskers at a temperature within a range from about 1500–3200° F.; and

finishing said at least one edge to exhibit a cutting edge for metal.

4,961,758

LIQUID MEMBRANE PROCESS FOR SEPARATING GASES

John K. Dobitz, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 15, 1988, Ser. No. 271,745
Int. Cl.[5] B01D *53/22*
U.S. Cl. 55—16 20 Claims

1. A liquid membrane process for separating a gaseous stream into a permeate stream of gases having predominantly lower equilibrium K values and a stream of gases having predominantly higher equilibrium K values, which comprises:

flowing a gaseous feed stream into contact with a supported liquid membrane,

said liquid membrane having an upstream side in contact with the feed stream and an opposite downstream side,

said feed stream and said liquid membrane being maintained at an operating pressure and temperature relatively near a dew point of the feed stream in the two phase liquid/gas

region of the phase envelope so that condensate from the feed stream will supply the liquid for the liquid membrane;

drawing off a stream of gases having predominantly higher equilibrium K values from the upstream side of the liquid membrane which failed to permeate through the liquid membrane; and

drawing off a permeate stream of gases having predominantly lower equilibrium K values from the downstream side of the liquid membrane which permeated through the liquid membrane.

4,961,759

CLOSED LOOP GAS DEHYDRATION PROCESS AND APPARATUS

John A. Taylor, Pinckney, Mich., assignor to Separation Dynamics, Inc., Southfield, Mich.

Filed Aug. 17, 1989, Ser. No. 394,954

The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.

Int. Cl.[5] **B01D** *53/22, 71/10*

U.S. Cl. 55—16 **4 Claims**

1. A method of drying a wet stream of gas, said method including the steps of: osmotically imbibing water from a wet gas stream flowing on one side of at least one hollow fiber membrane and forming a dried retentate stream, diffusing a water permeate to a second side of the hollow fiber membrane while preventing imbibing and diffusion of hydrocarbons and halogenated hydrocarbons therethrough; forming a sweep stream and removing the water permeate from the second side of the hollow fiber membrane therewith; and removing the dried retentate stream containing hydrocarbons and halogenated hydrocarbons therein, said method characterized by recirculating a portion of the dried retentate stream as the sweep stream in a closed fluid flow circuit.

4,961,760

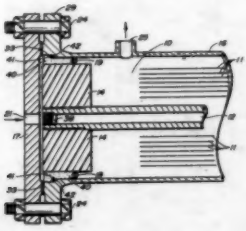
HOLLOW FIBER MEMBRANE FLUID SEPARATION DEVICE ADAPTED FOR BORESIDE FEED

Terrence L. Caskey, Concord; Janine L. Jorgensen, Clayton, and Johnny L. Trimmer, Antioch, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 309,756, Feb. 9, 1989, Pat. No. 4,929,259. This application Oct. 30, 1989, Ser. No. 429,928

Int. Cl.[5] **B01D** *53/22, 71/50*

U.S. Cl. 35—158 **24 Claims**



1. A hollow fiber membrane fluid separation device adapted for boreside feed comprising:

A. a plurality of hollow fiber membranes, wherein the hollow fiber membranes are arranged in a bundle and are adapted for the separation of one or more fluids from one or more other fluids in a feed fluid mixture;

B. a first tubesheet comprised of a thermoset or thermoplastic polymeric material located at the first end of the bundle, arranged such that the hollow fiber membranes are embedded in the first tubesheet and communicate through the first tubesheet and are open on the opposite face of the first tubesheet;

C. a second tubesheet comprised of a thermoset or thermoplastic polymeric material located at the second end of the bundle opposite the first end of the bundle, arranged such that the hollow fiber membranes are embedded in the second tubesheet and communicate through the second tubesheet and are open on the opposite face of the second tubesheet;

D. a core about which is arranged the hollow fiber membrane bundle, further arranged such that the core extends through and is bonded to the first tubesheet and the second tubesheet;

E. a casing means encasing the hollow fiber membrane bundle, the first and second tubesheets, and the core;

F. a first end capping means arranged and adapted for sealing the first end of the casing means at the end of the casing means near the first tubesheet;

G. a first attachment means arranged for attaching the first end capping means to the first end of the casing means;

H. a feed inlet means adapted for introducing the feed fluid mixture to be separated into the bores of the hollow fiber membranes by contacting the feed fluid mixture with the open hollow fiber membranes at the opposite face of the first tubesheet;

I. a feed inlet region defined by the first end capping means and the casing means located adjacent to the opposite face of the first tubesheet, wherein the feed inlet region is sealed such that fluid can only enter or leave the feed inlet region through the feed inlet means or the hollow fiber membranes, and the feed inlet region is arranged to introduce the feed fluid mixture into the bores of the hollow fiber membranes;

J. a first means for forming a seal between the first tubesheet means and the casing means such that fluid cannot communicate between the feed inlet region and the region between the two tubesheets which is outside of the hollow fiber membranes;

K. a second end capping means arranged and adapted for sealing the second end of the casing means at the end of the casing means near the second tubesheet;

L. a second attachment means arranged for attaching the second end capping means to the second end of the casing means;

M. a non-permeate outlet means adapted for removing fluid which does not permeate through the hollow fiber membranes from the bores of the hollow fiber membranes at the opposite face of the second tubesheet;

N. a non-permeate outlet region defined by the second end capping means and the casing means located adjacent to the opposite face of the second tubesheet, wherein the non-permeate outlet region is sealed such that fluid which does not permeate the hollow fiber membranes can only enter or leave the non-permeate outlet region through the hollow fiber membranes or the non-permeate outlet means and the non-permeate outlet region is arranged to remove the fluid which does not permeate the hollow fiber membranes from the bores of the hollow fiber membranes;

O. a second means for forming a seal between the second tubesheet means and the casing means such that fluid cannot communicate between the non-permeate outlet region and the region between the two tubesheets which is outside of the hollow fiber membranes;

P. a permeate outlet means for removing fluid which permeates through the hollow fiber membranes from the region between the two tubesheets which is outside of the hollow fiber membranes; and

Q. one or more means for channeling flow of fluid which permeates through the hollow fiber membranes to the region between the two tubesheets which is outside of the hollow fiber membranes, such means for channeling flow arranged to channel flow of fluid which permeates through the hollow fiber membranes in the longitudinal direction parallel to the core toward the permeate outlet means, wherein the means for channeling flow have one end embedded in or attached to the second tubesheet and

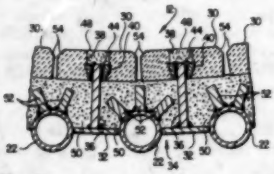
the second end located at a distance from the first tubesheet, said distance between the second end of the means for channeling flow and the first tubesheet being sufficient to allow the fluid which permeates through the hollow fiber membranes and flows along the means for channeling flow to flow to the permeate outlet means.

4,961,761

CYCLONE SEPARATOR WALL REFRACTORY MATERIAL SYSTEM

Richard C. Johnson, Dansville, N.Y., assignor to Foster Wheeler Energy Corporation, Clinton, N.J.

Filed Aug. 18, 1989, Ser. No. 395,863
Int. Cl.[5] B01D *45/12*
U.S. Cl. 55—269 **7 Claims**



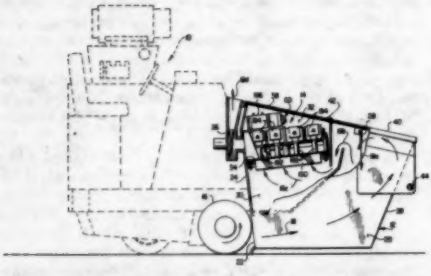
1. A cyclone separator comprising an inner cylinder, an outer cylinder extending around said inner cylinder in a coaxial relationship to define an annular chamber between said cylinders, said outer cylinder comprising a plurality of tubes extending vertically and circumferentially in a parallel relationship for at least a portion of their lengths, a plurality of continuous fins extending between adjacent tubes, said tubes and fins forming a waterwall said tubes having inlet and outlet means for conveying a coolant through said tubes, a plurality of wear blocks forming an inner surface of said outer cylinder and extending in a spaced relation to said waterwall, each of said wear blocks comprising a centrally located bore and a weldable member located at one end of said bore, a plurality of anchors extending perpendicularly from said fins, said weldable members being welded to said anchors, and refractory means extending between said waterwall and said wear blocks.

4,961,762

STRUCTURALLY REINFORCED, SELF-ALIGNING PANEL FILTER APPARATUS WITH ASSOCIATED CLAMPING, FACE SEALING AND BACKFLUSHING STRUCTURE

D. Franklin Howeth, 233 Chuck Wagon Trail, Fort Worth, Tex. 76108

Filed Dec. 9, 1988, Ser. No. 282,479
Int. Cl.[5] B01D *46/04*
U.S. Cl. 55—302 **36 Claims**



1. Disposable, structurally protected filter apparatus positionable over and alignable with a fluid flow opening, formed in a generally flat wall portion and bounded by a peripheral edge portion of the wall portion, to filter fluid traversing said opening, said filter apparatus comprising:

a panel filter media section having opposite sides and a peripheral edge portion;

filter media bracing means extending outwardly along said opposite sides of said filter media section;

a protective filter framing and support structure including:

an outer support frame member having an outer side wall portion with a side edge portion, and a peripheral lip portion extending transversely inwardly from said side edge portion, and

an inner peripheral face frame member extending around and captively retaining said peripheral edge portion of said filter media section, said inner peripheral face frame member having an outer side wall section and first and second inturned wall portions projecting from opposite side edges of said outer side wall section outwardly of and generally parallel to said peripheral edge portion of said filter media section said inner peripheral face frame member being recessed within said outer support frame member, in a direction toward said peripheral lip portion, and permanently secured within said outer support frame member; and

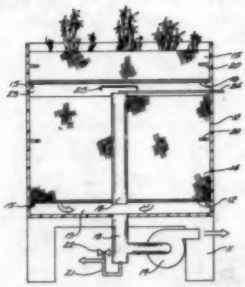
alignment means, extending transversely outwardly from said peripheral lip portion of said outer support frame member and removably insertable into said fluid flow opening to engage said peripheral edge portion thereof, for aligning said filter apparatus with said fluid flow opening in a direction parallel to said generally flat wall portion, in response to insertion of said alignment means into said fluid flow opening.

4,961,763

INDOOR AIR PURIFIER

T. Lewis Thompson, and James V. Alexander, both of Tucson, Ariz., assignors to Space Biospheres Venture, Oracle, Ariz.

Filed Apr. 19, 1989, Ser. No. 340,368
Int. Cl.[5] B01D *29/56, 53/04*
U.S. Cl. 55—312 **42 Claims**



1. A soil bed reactor room air purifier comprising:

a lower layer of soil containing aerobic microorganisms;

an upper layer of soil containing aerobic microorganisms above the lower layer of soil;

an air space between the upper and lower layers of soil;

means for passing air from a room through both layers of soil and discharging the air into the room in a first mode of operation;

means for passing air from a room though only one of the layers of soil and discharging the air into the room in a second mode of operation; and

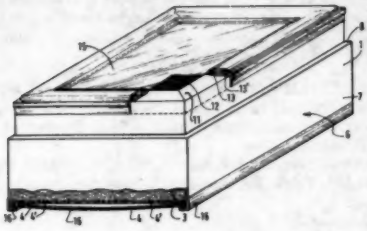
means for switching between the first and second modes of operation.

4,961,764

FILTERING UNIT AND FILTERING EQUIPMENT INCORPORATING SAID UNIT

Guy Develle, Domont, and Robert Chaperon, Meriel, both of France, assignors to Sofiltra Poelman, La Garenne Colombes, France

Filed Feb. 15, 1989, Ser. No. 311,273
Claims priority, application France, Feb. 19, 1988, 88 01984
Int. Cl.[5] B01D *50/00, 53/04*
U.S. Cl. 55—316 10 Claims



1. Filtering unit for incorporation in a filtering casing having walls, said unit comprising a housing having walls, and, within the housing, an anit-aerosol first filtering stage, a second filtering state, the first filtering stage being superposed on the second filtering stage, an inlet passage for gas to be filtered on an upstream side of the first filtering stage and a discharge passage for filtered gas on a downstream side of the second filtering stage relative to flow of air through the filtering unit, one of said passages having peripheral sealed junction means secured to said unit, for cooperation with a wall of the casing, and discrete first and second manually disengageable sealed impervious films individually peripherally sealingly adhered to the walls of the housing for closing the inlet and discharge passages, respectively, of the filtering unit.

4,961,765

ELECTRICAL VACUUM CLEANER AND FILTER BAG FOR SAME

Wieland Gühne, Remscheid; Heinz-Jürgen Ahlf, Bergisch-Gladbach, and Manfred Eckart, Wuppertal, all of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Apr. 14, 1989, Ser. No. 338,876
Claims priority, application Italy, Apr. 29, 1988, 12462 A/88
The portion of the term of this patent subsequent to Dec. 5, 2006, has been disclaimed.
Int. Cl.[5] B01D *46/02*
U.S. Cl. 55—367 14 Claims

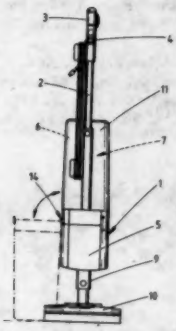
12. A vacuum cleaner filter bag comprising

a bag body closed at one end;

an end wall engaging with said body at a second end of said body opposite said one end; and

wherein said end wall has an opening for the bag to serve as an air inlet to the bag;

said end wall has grip notches and three tongues arranged in angular symmetry to the bag opening; and



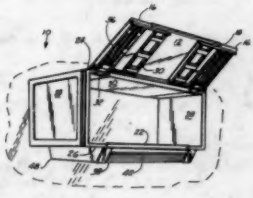
two of the tongues are arranged on a side edge of the bag opening and extend directly into the grip notches via oblique flanks of the tongues.

4,961,766

ADJUSTABLE VENTILATION, AIR PURIFICATION AND STORAGE APPARATUS FOR MODULAR OFFICE FURNITURE

James S. Hogan, P.O. Box 1056, Gulf Breeze, Fla. 32561

Filed Aug. 21, 1989, Ser. No. 396,037
Int. Cl.[5] B01D *50/00*
U.S. Cl. 55—385.2 5 Claims



1. An adjustable component cabinet for providing ventilation, air purification and storage to a modular work station comprising:

(a) a cabinet having top, bottom, front and opposing side walls, a back of said cabinet remaining open;

(b) a pair of top wall extensions slidably and telescopically secured to opposing end regions of said top wall;

(c) a pair of bottom wall extensions slidably and telescopically secured to opposing end regions of said bottom wall;

(d) each of said side walls being secured to a said top wall extension and a said bottom wall extension, said side walls being movable with said extensions; and,

(e) a pair of front wall extensions slidably and telescopically secured to opposing end regions of said front wall;

(f) a hinge assembly pivotally securing each of said front wall extensions to its respective said top wall extension thereby enabling said front, top, and bottom wall extensions and their respective side wall to slide in unison;

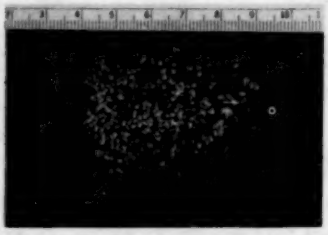
(g) a lower ventilation and air purification means secured to and underneath said bottom wall intermediate said side walls, said lower ventilation means comprising a front grill, an internal filter and a rear grill for ventilation therethrough.

4,961,767

METHOD FOR PRODUCING ULTRA-HIGH PURITY, OPTICAL QUALITY, GLASS ARTICLES

Paul M. Schermerhorn, Painted Post; and Michael P. Teter, both of Corning, N.Y., assignors to Corning Incorporated, Corning, N.Y.

Continuation of Ser. No. 271,709, Nov. 16, 1988, abandoned, which is a division of Ser. No. 52,619, May 20, 1987, Pat. No. 4,789,389. This application Jun. 29, 1989, Ser. No. 373,628
Int. Cl.[5] C03B *37/023, 37/016, 19/06*
U.S. Cl. 65—2 4 Claims



1. A method for consolidating a green body comprising the steps of:

(a) drying and partially sintering the green body in a chamber by:

(i) raising the temperature of the chamber to above about 1000° C.: and

(ii) introducing chlorine into the chamber during at least a portion of said drying and partial sintering to reduce the level of bound water associated with the green body:

(b) fully sintering the green body in a chamber by raising the temperature of the chamber to a temperature above about 1720° C. while applying a vacuum to the chamber; and

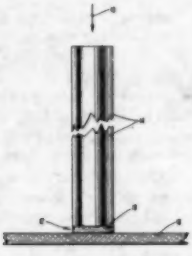
(c) hot isostatic pressing the fully sintered green body in a chamber by raising the temperature of the chamber to above about 1150° C. and introducing an inert gas into the chamber at a pressure above about 100 psig.

4,961,768

METHODS FOR BONDING OPTICAL FIBERS TO WAFERS

Nicholas I. Djeu, 3912 Northhampton Way, Tampa, Fla. 33624

Filed Apr. 20, 1989, Ser. No. 340,946
Int. Cl.[5] C03B *23/207*
U.S. Cl. 65—4.21 10 Claims



1. A method of bonding an optical fiber to a substantially opaque material, comprising the steps of:

selecting an optical fiber and an opaque material that are substantially non-absorptive and absorptive, respectively, to coherent electromagnetic radiation of a preselected wavelength;

positioning said optical fiber and opaque material in abutting relation to one another;

preselecting a wavelength of coherent electromagnetic radiation that is substantially unabsorbed by said optical fiber and that is substantially absorbed by said opaque material;

directing coherent electromagnetic radiation of said preselected wavelength to a site where said optical fiber and said opaque material abut one another through the axial bore of said optical fiber;

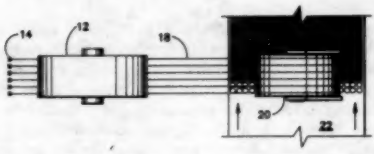
whereby a thin surface layer of said opaque material is temporarily melted by the heat energy absorbed by said opaque material, and whereby said optical fiber is substantially unaffected by said radiation, so that a bond is formed between optical fiber and the opaque material when said thin surface layer of opaque material cools and solidifies.

4,961,769

MAT PATTERN CONTROL SYSTEM AND METHOD

William R. Miller, Bremen, and Jerome P. Klink, Granville, both of Ohio, assignors to Superior Glass Fibers, Inc., Bremen, Ohio

Continuation-in-part of Ser. No. 309,301, Feb. 13, 1989, Pat. No. 4,921,517. This application Feb. 2, 1990, Ser. No. 474,352
Int. Cl.[5] C03B *37/02*
U.S. Cl. 65—4.4 26 Claims



1. In a glass fiber mat manufacturing method comprising passing at least one glass fiber over at least one cylindrical drum and subsequently releasing and projecting the fiber onto a forming surface by a release mechanism operating at a primary oscillation across the forming surface of the angle of the trajectory of the glass fiber relative to the forming surface, an improved mat pattern control method comprising superimposing a secondary oscillation of the angle of the trajectory of the glass fiber relative to the forming surface upon the primary oscillation at a higher frequency and lower amplitude than the primary oscillation.

4,961,770

PROCESS FOR PRODUCING SPHERICAL GLASS PARTICLES

Walter A. Johnson, Towanda; Nelson E. Kopatz, and Lori S. Pruyne, both of Sayre, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 54,116, May 22, 1987, abandoned, which is a continuation of Ser. No. 836,923, Mar. 6, 1986, abandoned. This application Mar. 6, 1989, Ser. No. 319,791
Int. Cl.[5] C03B *19/10*
U.S. Cl. 65—21.3 4 Claims

1. A process for producing substantially spherical particles comprising:

(a) providing irregularly shaped glass particles having a predetermined particle size of less than about 20 micrometers in diameter;

(b) entraining said particles in a carrier gas;

(c) feeding said particles into a high temperature zone having a temperature sufficiently above the softening point of said glass to allow surface tension to subsequently spheroidize said glass particles and having a temperature below the vaporization temperature of said glass, said high temperature zone being from about 5500° C. to about 17,000° C.;

(d) maintaining said particles in said temperature zone for a sufficient time to convert at least about 90% of said parti-

cles into droplets without formation of substantial amounts of filaments; and

(e) cooling said droplets to form solid spheres having essentially the same particles size as said irregularly shaped particles and a reduced surface area as compared with said irregularly shaped particles.

4,961,771

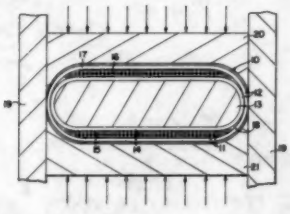
STRESS-FREE COMPOSITE AND A METHOD OF AND ARRANGEMENT FOR MANUFACTURING THE SAME

Arthur W. Brooke, Jr., Lake Park, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1988, Ser. No. 290,664

Int. Cl.[5] C03B *19/06*

U.S. Cl. 65—18.3 **3 Claims**



1. A method of manufacturing a stress-free composite body that includes reinforcing fibers embedded in and bonded to a matrix material such that differential contraction takes place in the matrix material relative to the reinforcing fibers in response to temperature decrease, and the composite material of which is expected to reach a predetermined operating temperature after the manufacture of the composite has been completed, and the composite body is used comprising the steps of

embedding the reinforcing fibers in the matrix material to obtain a composite precursor longitudinally stretching at least some of the reinforcing fibers;

subsequently consolidating the composite precursor into the composite body at a consolidation temperature that is significantly higher than the predetermined operating temperature;

causing the composite material to cool at least to the predetermined operating temperature; and

maintaining said at least some reinforcing fibers in stretched conditions during at least said causing step and until the temperature of the composite material has decreased sufficiently below the consolidation temperature, including performing said longitudinally stretching step to such an initial extent that the longitudinal dimension of any portion of each such reinforcing fiber is at most substantially the same as that of the contiguous portion of the matrix material that is bonded to said any portion, both at the consolidation temperature with the respective reinforcing fiber stretched to said initial extent, and at the predetermined operating temperature of the composite material in the absence of such stretching.

4,961,772

METHOD AND APPARATUS FOR CONTINUOUSLY MELTING GLASS AND INTERMITTENTLY WITHDRAWING MELTED GLASS

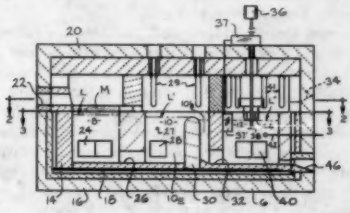
Raymond K. Daly, Stone, and James A. Flavell, Shifnal, both of United Kingdom, assignors to Toledo Engineering Co., Inc., Toledo, Ohio

Filed Sep. 11, 1989, Ser. No. 405,223

Claims priority, application United Kingdom, Sep. 20, 1988, 8822093

Int. Cl.[5] C03B *5/00, 5/18, 5/26*

U.S. Cl. 65—134 **17 Claims**



1. A method for melting solid material in a furnace having a melting chamber and a working chamber separated by a weir, comprising:

(A) continuously feeding said solid material into said melting chamber,

(B) continuously melting said material in said melting chamber,

(C) maintaining a constant level of the melted material in said melting chamber by continuously flowing the melted material over a weir to said working chamber, and

(D) withdrawing melted material from said working chamber during intermediate periods of time at a rate greater than the flow of material over said weir to said working chamber.

4,961,773

APPARATUS FOR PROCESSING A MELTED GLASS STREAM INTO A MELTED GLASS LUMP OF A PREDETERMINED VOLUME

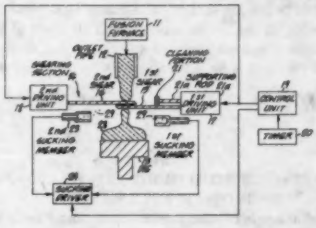
Hiroaki Takahara, and Shigeru Asanuma, both of Tokyo, Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Mar. 31, 1989, Ser. No. 332,295

Claims priority, application Japan, Mar. 31, 1988, 63-80124

Int. Cl.[5] C03B *9/46*

U.S. Cl. 65—174 **11 Claims**



1. In an apparatus for processing a melted glass stream flowing in a first direction at a first speed into a melted glass lump flowing in said first direction at a second speed faster than said first speed, said apparatus comprising first and second shears arranged in a second direction substantially perpendicular to said first direction for cutting said melted glass stream into said

melted glass lump and driving means coupled to said first and said second shears for driving said first and second shears, the improvement wherein said driving means comprises:

a movement mechanism mechanically connected to said first and said second shears for selectively moving said first and said second shears in both said first direction and said second direction; and

control means coupled to said movement mechanism for controlling said movement mechanism to selectively and successively move said first and said second shears through said movement mechanism in said second and said first directions;

said control means comprising;

first means for controlling said movement mechanism to move said first and said second shears in said second direction at a predetermined position in said first direction to thereby close said first and said second shears;

second means for controlling said movement mechanism to move said first and second shears from said predetermined position to a prescribed position positioned downstream relative to said predetermined position in said first direction at a third speed between said first speed and said second speed after said first and said second shears are closed;

third means for controlling said movement mechanism to open said first and said second shears at said prescribed position in said second direction after said first and said second shears have been moved from said predetermined position to said prescribed position; and

fourth means for controlling said movement mechanism to return said first and said second shears back from said prescribed position to said predetermined position in said first direction after said first and said second shears are opened.

4,961,774

PROCESS FOR THE CULTIVATION OF AQUATIC PLANTS, THE RESULTING PLANTS, AND THEIR USES

José Brochier, Castries, France, assignor to Spie Batignolles, Puteaux, France

Division of Ser. No. 908,817, Sep. 18, 1986, abandoned. This application Feb. 8, 1988, Ser. No. 153,718

Claims priority, application France, Sep. 23, 1985, 85 14055

Int. Cl.[5] A01N *65/00*

U.S. Cl. 71—77 **3 Claims**

1. A method for the bio-stimulation of the growth of plants, said method comprising applying to plants under cultivation an effective bio-stimulating amount of a bio-stimulant solution derived from water hyacinth, said solution produced by the steps of pressing the water hyacinth to obtain a juice, and filtering the resulting juice to obtain said solution comprising from between 1 and 2 percent solids by weight, said bio-stimulant solution being applied to said plants in diluted form, said dilution being in the proportion of 5 to 30 liters of water to 1 liter of solution and said diluted solution being sprayed on the cultivated plants in a proportion of 300 to 1500 liters per hectare.

4,961,775

BRASSINOSTEROID DERIVATIVES AND PLANT GROWTH REGULATORS

Suguru Takatsuto, Niigata; Hitoshi Sato, and Fumio Futatsuya, both of Saitama, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha and Tama Biochemical Co., Ltd., both of Tokyo, Japan

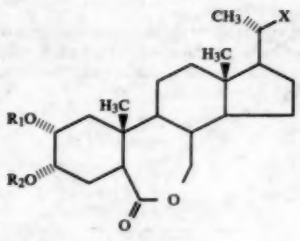
Filed Oct. 27, 1988, Ser. No. 263,630

Claims priority, application Japan, Nov. 10, 1987, 62-282110

Int. Cl.[5] A01N *43/22, 43/20*

U.S. Cl. 71—88 **5 Claims**

1. A brassinosteroid derivative represented by the formula:

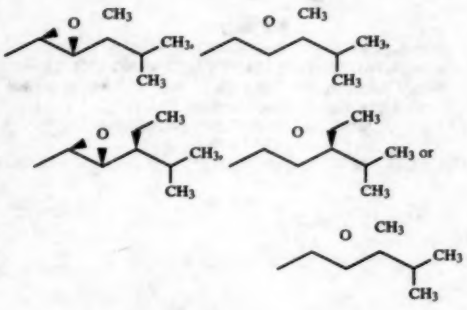


wherein R_3 represents C_1-2-alkyl,

R1 and R2 which may be the same or different,

a represent hydrogen, acetyl or propionyl respectively,

wherein R_1 and R_2 represent hydrogen or acetyl, X represent



4,961,776

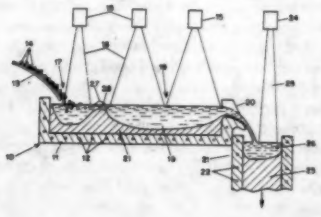
COLD HEARTH REFINING

Howard R. Harker, Malvern, Pa., assignor to Axel Johnson Metals, Inc., Lionville, Pa.

Division of Ser. No. 217,566, Jul. 11, 1988. This application Jun. 8, 1989, Ser. No. 363,160

Int. Cl.[5] C22B *4/00*

U.S. Cl. 75—10.19 **5 Claims**



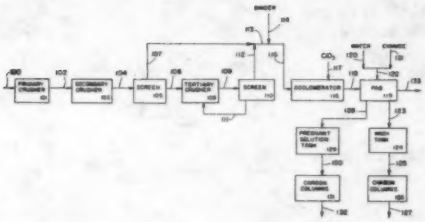
1. A method for melting and refining material in a cold hearth system comprising cooling a hearth in which material is to be melted and refined, supplying solid raw material which is to be melted and refined in a melting region of the hearth, applying energy to the region of the hearth to which the solid material is supplied to produce molten material, flowing molten material from the melting region toward a refining region of the hearth spaced from the melting region, applying energy to the refining region of the hearth to refine molten material therein, and selectively controlling the application of energy to the hearth so as to cause formation of a partial barrier of skull material between the melting region and the refining region to prevent unmelted raw material from being transported from the melting region to the refining region.

4,961,777

PRETREATMENT/AGGLOMERATION AS A VEHICLE FOR REFRACTORY ORE TREATMENT

Jesus W. Perez, New Orleans; Melvin J. Barrois, Belle Chasse; Thomas H. McCord, Harvey, all of La., and Gregory R. O'Neil, Marmion, Australia, assignors to Freeport-McMoRan, Inc., New Orleans, La.

Filed Aug. 3, 1988, Ser. No. 227,639
Int. Cl.[5] C22B *11/00*
U.S. Cl. 75—313 20 Claims



10. A method for recovering metals selected from the group consisting of gold and silver from ores containing the same which ores are refractory because of the ore's content of sulfidic and/or carbonaceous matter comprising:

a. subjecting said refractory ore to crushing operations to essentially reduce the ore particle size of said refractory ore to less than about ¼ inch diameter;

b. introducing said crushing refractory ore to an agglomerator;

c. adding to said agglomerator containing said crushed refractory ore a binder selected from the group consisting of Portland cement, gypsum cement, or a mixture of the two, at the rate of about 5 to 20 pounds per ton of ore;

d. adding to said agglomerator containing said crushed refractory ore and said binder, a 5 to 15% aqueous solution selected from the group consisting of sodium hypochlorite, calcium hypochlorite or mixtures thereof in an amount equivalent to about 5 to 45 pounds of available chlorine per tone of ore;

e. agitating the mixture of refractory ore, binder, and aqueous hypochlorite solution contained in said agglomerator for sufficient time to obtain satisfactory distribution of mixture compounds;

f. rolling said agitated mixture contained in said agglomerator for sufficient time to allow agglomerates of coarse and fine refractory ore particles to form;

g. transferring said agglomerates to an impervious or semi-impervious pad;

h. allowing said agglomerates contained on said pad to cure for about 1 to 5 days,

i. water washing said agglomerates contained on said pad for sufficient time to remove all or substantially all hypochlorite values;

j. leaching said agglomerates contained on said pad with a dilute alkaline cyanide solution containing about 0.5 to 2.0 grams/liter of sodium cyanide and about 0.3 to 1.0 grams/liter of sodium hydroxide, for sufficient time to dissolve a substantial part of at least one of the metals being recovered and contained in said ore, and

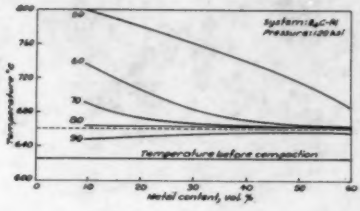
k. recovering said dissolved at least one metal from solution.

4,961,778

DENSIFICATION OF CERAMIC-METAL COMPOSITES

Aleksander J. Pyzik; Irving G. Snyder, Jr., both of Midland, Mich; Alexander Pechenik, Los Angeles, Calif., and Robert R. McDonald, Traverse City, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 13, 1988, Ser. No. 143,560
Int. Cl.[5] C22C *29/00*
U.S. Cl. 75—230 28 Claims



1. A method of producing a dense ceramic and metal mixture or composite, comprising:

forming a substantially homogeneous mixture of a ceramic and metal;

heating said mixture to a first temperature that approximates but is below that temperature at which said metal begins to flow; and

pressing said mixture at such pressure that compaction and densification of said mixture occurs and an induced, second temperature of said mixture results, wherein said second temperature exceeds the flowing temperature of said metal such that said mixture is further compacted and densified, said second temperature and duration thereof remaining below that at which significant reaction between said metal and ceramic occurs.

25. A ceramic-metal composite produced by the method of claim 1, said densified composite having a composition and ceramic grain size substantially similar to the initial homogeneous mixture of ceramic and metal.

4,961,779

ALUMINUM COMPOSITE MATERIAL

Jun Kusui, Yokaichi; Akiei Tanaka, Omihachiman, and Masahiko Kawai, Nara, all of Japan, assignors to Toyo Aluminium Kabushiki Kaisha, Japan

Filed Apr. 10, 1989, Ser. No. 335,719
Int. Cl.[5] C22C *29/00*
U.S. Cl. 75—231 6 Claims

1. A composite material of aluminum powder containing artificially synthesized, spherical carbon particles having a non-lamellar, and vitreous or amorphous structure, having a high strength of about 10 kg/mm^2 or more in flexure strength, and having a mean particle size of about 1 to about 50 μm

4,961,780

BORON-TREATED HARD METAL

Donald C. Pennington, Jr., Louisville, Ky., assignor to Vermont American Corporation, Louisville, Ky.

Continuation-in-part of Ser. No. 211,197, Jun. 29, 1988, which is a continuation-in-part of Ser. No. 167,000, Mar. 11, 1988, abandoned. This application Mar. 6, 1989, Ser. No. 317,612

Int. Cl.[5] C22C *29/04*

U.S. Cl. 75—238 16 Claims

1. A cemented carbide body, comprising:
a tungsten carbide phase;
a cobalt binder phase; and
a third phase comprising cobalt, tungsten, boron, and carbon.

4,961,781

HIGH CORROSION-AND WEAR RESISTANT-POWDER SINTERED ALLOY AND COMPOSITE PRODUCTS

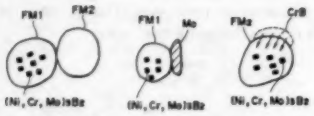
Masao Morishita, Kobe; Hiroshi Kawatani, Kakogawa, and Toshiyuki Minamide, Takasago, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Sep. 27, 1988, Ser. No. 249,995

Claims priority, application Japan, Sep. 30, 1987, 62-246288; Nov. 30, 1987, 62-302498; Dec. 24, 1987, 62-328212; Mar. 24, 1988, 63-070714

Int. Cl.[5] C22C *29/14*

U.S. Cl. 75—244 9 Claims



1. Wear resistant powder sintered alloy of excellent corrosion resistance comprising a hard alloy containing from 15 to 95% of a hard phase composed of a M_3B_2 phase (M represents Ni or Co, Cr, Mo or W) structure in the matrix, wherein said hard alloy consists essentially of, on a weight basis, 0.5–9.0% of B, 14.0–35.0% of Cr, 14.0–50.0% of one or more of Mo and W, up to 3.5% of Si, 0.5–20.0% of one or more of Cu, Ag, Au and Pt and the balance of one or more of Ni and Co and inevitable impurities, and the matrix has a noble corrosion potential.

4,961,782

ULTRASONIC MACHINING TOOL FOR MACHINING ORTHODONTIC BRACKETS

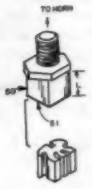
James F. Reher, Pomona, and Farrokh Farzin-Nia, Inglewood, both of Calif., assignors to Manufacturers Hanover Trust Company, New York, N.Y.

Division of Ser. No. 239,320, Sep. 1, 1988, which is a division of Ser. No. 214,585, Jul. 1, 1988, which is a division of Ser. No. 46,430, May 6, 1987, Pat. No. 4,838,786. This application Dec. 4, 1989, Ser. No. 445,489

Int. Cl.[5] B22F *9/00*

U.S. Cl. 75—246 1 Claim

1. A disposable ultrasonic machining tool for machining a plurality of orthodontic brackets at the same time, said tool being made of the following materials by weight:



Cobalt: 25 percent
Iron: balance

4,961,783

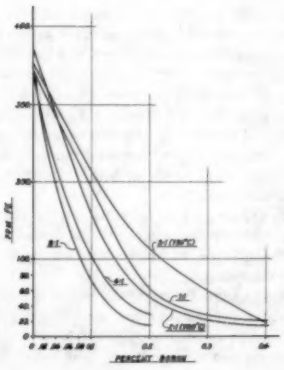
COMPOSITION FOR REMOVING IRON CONTAMINATION FROM MAGNESIUM

James E. Hillis, Angleton, and William G. Green, Freeport, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 873,905, Jun. 13, 1986, Pat. No. 4,773,930. This application Jun. 8, 1988, Ser. No. 204,160

Int. Cl.[5] C22B *26/22*

U.S. Cl. 75—307 2 Claims



1. A composition for reducing metallic impurities, which contain iron, and which are present in primary magnesium, to an iron level of less than 100 ppm while the primary magnesium is molten in a crucible heated at about 650° C. to about 780° C. by externally-applied heat,

said composition comprising a mixture of boron oxide or boric acid and a flux, wherein the ratio of flux to boron oxide or boric acid is from about 8:1 to about 1:1 and wherein the flux comprises 43% KCl, 8–11% $BaCl_2$, 2–5% CaF_2, 31–37% $MgCl_2$, and a maximum of about 4% of MgO.

4,961,784

METHOD OF SMELTING REDUCTION OF CHROMIUM RAW MATERIALS AND A SMELTING REDUCTION FURNACE THEREOF

Haruyoshi Tanabe; Masahiro Kawakami; Kenji Takahashi; Katsuhiro Iwasaki, and Shigeru Inoue, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

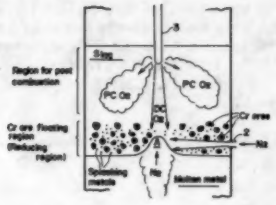
PCT No. PCT/JP88/00800, § 371 Date Apr. 13, 1989, § 102(e) Date Apr. 13, 1989, PCT Pub. No. WO89/01532, PCT Pub. Date Feb. 23, 1989

PCT Filed Aug. 11, 1988, Ser. No. 360,916

Claims priority, application Japan, Aug. 13, 1987, 87/201002; Dec. 26, 1987, 87/330977; Dec. 26, 1987, 87/330980

Int. Cl.[5] C22B *34/00*

U.S. Cl. 75—623 6 Claims



1. A method of smelting reduction of Cr containing raw materials, in a smelting reduction furnace provided with bottom blowing tuyeres, side blowing tuyeres and a top blowing lance, comprising steps of reducing Cr ores by carbonaceous materials to produce high Cr molten metal, decarburizing said high Cr molten metal in the same furnace, comprising the steps of

(a) blowing CO and/or inert gas (N_2, Ar) from the bottom blowing tuyeres,

(b) blowing CO and/or inert gas from the side blowing tuyere such that at least a part of the gas contacts an upheaval of the molten metal made by the bottom blowing gas,

(c) blowing a decarburizing O_2 into the molten metal from the top blowing lance and a post combustion O_2 into the slag concurrently, and

(d) reducing Cr by maintaining a ratio of the post combustion to be more than 0.3.

4,961,785

SMEAR RESISTANT INKS FOR THERMAL INK-JET PRINTERS

John M. Skene, Lake Oswego; Charles L. Thierheimer, Jr., and Suraj L. Hindagolla, both of Corvallis, all of Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 9, 1989, Ser. No. 309,516

Int. Cl.[5] C09D *11/02*

U.S. Cl. 106—22 10 Claims

1. An ink suitable for ink-jet printing, consisting of, by weight,

(a) from about 15% to about 50% formamide,

(b) from about 1% to about 10% dye,

(c) a buffer to provide a pH from about 4 to about 10,

(d) from 0% up to about 10% drying time improver selected from the group consisting of lower alcohols having from 1 to about 4 carbon atoms,

(e) from 0% up to about 0.1% of a non-corrosive, low toxicity, water-soluble conductive salt,

(f) a biocide, and

(g) water.

4,961,786

LANTHANIDE OXIDES AND PHOSPHATES FOR IMPROVING PROPERTIES OF HEATED REFRACTORY CONCRETE

Thomas Novinson, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 161,503, Feb. 29, 1988, abandoned. This application May 1, 1989, Ser. No. 345,874

Int. Cl.[5] C04B *7/32, 35/44*

U.S. Cl. 106—692 15 Claims

1. An improved refractory cementitious composition consisting essentially of:

a dry mixture of a high alumina content calcium aluminate cement and approximately 0.5 to 5.0 percent by weight of dry ingredients of at least one lanthanide compound selected from the group consisting of the oxides, carbonates, phosphates and sulfates of cerium and lanthanum admixed with from 10 to 15 percent by weight of water to provide a refractory composition;

said refractory composition when cured at a range of 500 to 1000 degrees Fahrenheit having an increased strength of up to 1500 psi over that of the same calcium aluminate cement without the added lanthanide compound.

4,961,787

CEMENT COMPOSITION

Amalendu J. Majumdar, St, Albans, and Bahadur Singh, Watford, both of England, assignors to National Reserach Development Corporation, London, England

Filed Sep. 28, 1988, Ser. No. 250,093

Claims priority, application United Kingdom, Oct. 15, 1987, 8724184; Feb. 23, 1988, 8804111; Aug. 12, 1988, 8819212

Int. Cl.[5] C04B *7/00*

U.S. Cl. 106—692 6 Claims

1. A hydraulic cement-forming composition which comprises from 30 to 70% by weight of a high-alumina cement blended with from 70 to 30% by weight of granulated glassy blast furnace slag, wherein the high alumina cement is made from bauxite and has a composition comprising CaO in an amount from 35 to 45% by weight; and Al_2O_3 in an amount from 38 to 55% by weight, and the granulated glass blast furnace slag has a composition comprising CaO from 28 to 50% by weight; SiO_2 from 28 to 38% by weight; and Al_2O_3 from 10 to 24% by weight, the composition being such that, upon hydration of the composition, gehlenite octahydrate is formed, and its proportion in mature pastes exceeds 5 wt %.

4,961,788

ADHESIVE BINDERS FOR PAPER COATING COMPOSITION HAVING IMPROVED STABILITY AND WHITENESS

Thomas L. Krinski, Granite City, Ill.; Tam H. Tran, and Jeffrey J. Gambaro, both of St. Loius, Mo., assignors to Protein Technologies International, Inc., St. Louis, Mo.

Filed Jun. 28, 1989, Ser. No. 372,898

Int. Cl.[5] C08L *80/00*

U.S. Cl. 106—154 13 Claims

1. A method of producing a modified protein adhesive having improved stability, dispersability and whiteness comprising isolating a vegetable protein material, hydrolysing the protein material to produce an adhesive protein, carboxylating the adhesive protein and treating the carboxylated adhesive protein with an oxidizing material at a pH of about 9.5, the oxidizing material being effective to impart substantially increased stability and room temperature shelf life to coating compositions containing the adhesive protein and increasing the ability of the adhesive binder to from high solids coating compositions, the adhesive binder produced also forming paper coatings having increased gloss, brightness and white color in comparison to conventional vegetable protein containing paper coatings.

4,961,789

PROCEDURES FOR THE PREPARATION AND FABRICATION OF CONCRETE ADDITIVES PRODUCED FROM NATURAL PRODUCTS

Luis P. Barreneches, Aptdo. Correo Carmelitas 55, Caracas, Venezuela

Filed Nov. 18, 1988, Ser. No. 272,811
Int. Cl.[5] C04B 24/10
U.S. Cl. 106—823 12 Claims

1. A process for manufacturing a concrete additive comprises the steps of:

a. forming a first homogenized mixture containing water and calcium terpineate;

b. forming a second homogenized mixture containing water and sodium hydroxide;

c. forming a dilution of soluble molasses concentrate in water; and

d. mixing together said dilution of soluble molasses concentrate with said first homogenized mixture, said second homogenized mixture and a water solution of formaldehyde to form a water reducing and plasticizing additive for concrete,

the additive comprising about 0.004% by weight calcium terpineate, about 1.25% by weight sodium hydroxide, and about 0.37 by weight formaldehyde,

the solution of soluble molasses concentrate being formed such that said additive has a density of about 1.18 to 1.20 Kg/dm^3.

4,961,790

CONCRETE ADMIXTURE DEVICE AND METHOD OF USING SAME

Dwight Smith, Duncan, Okla., and Jack L. Edwards, Dallas, Tex., assignors to Fritz Chemical Company, Dallas, Tex.

Filed May 19, 1989, Ser. No. 354,299
Int. Cl.[5] C04B 22/00, 24/00
U.S. Cl. 106—315 3 Claims

1. A method for modifying the properties of a concrete comprising:

introducing a solid admixture, contained in a water-soluble container, into a wet mixer to give a resulting mix, said solid admixture being selected from the group consisting of air-entraining admixtures, air detrainer admixture, accelerating admixture, alkali-reactivity reducer, superplasticizer, pumping aids, water-reducing admixture, corrosion inhibitor, permeability reducer, and fibers; said water-soluble container being selected from the group consisting of polyvinyl alcohol container and polyethylene oxide container; and

thereafter agitating said resulting mix for a sufficient amount of time to dissolve said water-soluble container and to disperse the mixture in the concrete in a substantially uniform fashion.

4,961,791

PIG IRON FOR THE MANUFACTURE OF BRAKE BODIES

Horst Metzler, and Gunther Schwarz, both of Tuttlingen, Fed. Rep. of Germany, assignors to Schwabische Huttenwerke GmbH, Fed. Rep. of Germany

Filed Feb. 11, 1988, Ser. No. 155,043
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1987, 3704680
Int. Cl.[5] C21D 5/02; C22C 37/00
U.S. Cl. 148—2 2 Claims

1. A brake body which has been cast from a cast-iron mold and made of a pig iron alloy material consisting essentially of:

carbon in an amount of 3.65 to 3.75 weight %;

manganese in an amount of 0.60 to 0.70 weight %;

silicon in an amount not exceeding 2.10 weight %;

phosphorus in an amount less than 0.09 weight %;

sulfur in an amount less than 0.10 weight %; and

iron in an amount of 93.26 to 95.75 weight %;

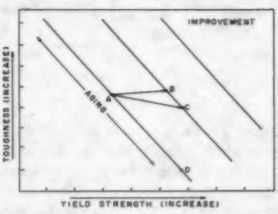
said pig iron alloy material having been heat treated to a temperature of at least about 920° C. for a sufficient period of time to decompose carbide formed therein and then cooled slowly in an annealing furnace, and having a pearlitic structure and said brake body having a tensile strength of at least 250 N/mm^2.

4,961,792

ALUMINUM-LITHIUM ALLOYS HAVING IMPROVED CORROSION RESISTANCE CONTAINING MG AND ZN

Roberto J. Rioja, Burrell; Alex Cho, Monroeville, and Philip E. Bretz, Pittsburgh, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 685,731, Dec. 24, 1984, Pat. No. 4,797,165, which is a continuation-in-part of Ser. No. 594,344, Mar. 29, 1984, Pat. No. 4,648,913. This application Mar. 24, 1988, Ser. No. 172,506
Int. Cl.[5] C22F 1/04
U.S. Cl. 148—12.7 A 35 Claims



19. Method of making aluminum base alloy products having combinations of improved strength, corrosion resistance and fracture toughness, the method comprising the steps of:

(a) providing a lithium-containing aluminum base alloy product consisting essentially of 0.2 to 5.0 wt.% Li, 0.05 to 6.0 wt.% Mg, 2.45 to 2.95 wt.% Cu, 0.05 to 0.12 wt.% Zr, 0.05 to 12 wt.% Zn, 0.5 wt.% max. Fe, 0.5 wt.% max. Si, the balance aluminum and incidental impurities, the product having imparted thereto, prior to an aging step, a working effect equivalent to stretching so that after an aging step the product has improved combinations of strength and toughness; and

(b) imparting to said product, prior to an aging step, a working effect equivalent to stretching said product at room temperature in order that, after an aging step, said product can have improved combinations of strength and fracture toughness in addition to corrosion resistance.

4,961,793

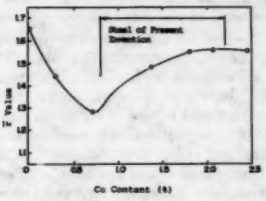
HIGH-STRENGTH COLD-ROLLED STEEL SHEET HAVING HIGH R VALUE AND PROCESS FOR MANUFACTURING THE SAME

Koji Kishida, and Osamu Akisue, both of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

PCT No. PCT/JP88/00640, § 371 Date Nov. 18, 1988, § 102(e) Date Nov. 18, 1988, PCT Pub. No. WO88/10319, PCT Pub. Date Dec. 29, 1988
PCT Filed Jun. 27, 1988, Ser. No. 320,268
Claims priority, application Japan, Jun. 26, 1987, 62-157892
Int. Cl.[5] C21D 8/04; C22C 38/16
U.S. Cl. 148—12 C 12 Claims

1. A heat-treatment-hardenable cold-rolled steel sheet having a high r value, comprising 0.010% or less of carbon, 0.05 to 0.5% of manganese, 1.0% or less of silicon, 0.001 to 0.030% of sulfur, 0.03% or less of phosphorus, 0.0050% or less of nitro-

gen, 0.005 to 0.10% of sol. aluminum, and from more than 1.0, to 2.2% of copper with the balance being iron and unavoidable



elements and substantially comprising a recrystallized ferritic single phase structure.

4,961,794

PHOSPHATE COATINGS FOR METAL SURFACES

Satoshi Miyamoto, and Masamichi Nagatani, both of Neyagawa-shi, Japan, assignors to Henkel Corporation, Ambler, Pa.

Continuation of Ser. No. 159,474, Feb. 16, 1988, Pat. No. 4,838,957, which is a continuation of Ser. No. 770,031, Aug. 27, 1985, abandoned, which is a continuation-in-part of Ser. No. 526,177, Aug. 24, 1983, abandoned. This application Feb. 1, 1989, Ser. No. 305,254

Claims priority, application Japan, Aug. 24, 1982, 57-147226

The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.

Int. Cl.[5] C23C *22/18*

U.S. Cl. 148—262 **1 Claim**

1. A process for reducing white spots during phosphating a galvanized metal surface, comprising treating the galvanized metal surface with an acidic aqueous substantially chlorate-free phosphate solution consisting essentially of:

(a) from about 0.1 to about 1.5 g/l of zinc ions;

(b) from about 5 to about 50 g/l of phosphate ions,

(c) from about 0.2 to about 4 g/l of manganese ions,

(d) at least about 0.05 g/l of a fluoride ion,

(e) less than 0.5 g/l of chloride ions,

(f) an effective amount of a phosphating accelerator, and

(g) up to about 4 g/l of nickel ions.

4,961,795

COMPOSITION AND PROCESS FOR BONDING LIGNOCELLULOSIC MATERIAL

William D. Detlefsen, Eugene; Earl K. Phillips, Springfield, both of Oreg., and Richard V. Norton, Wilmington, Del., assignors to Borden, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 145,639, Jan. 14, 1988, abandoned, which is a continuation of Ser. No. 903,253, Sep. 3, 1986, abandoned. This application Jan. 27, 1988, Ser. No. 149,102

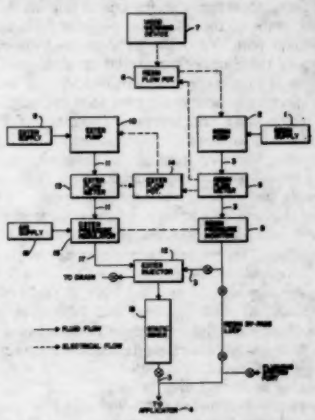
Int. Cl.[5] B32B *21/02*

U.S. Cl. 156—62.2 **26 Claims**

1. In a process of bonding lignocellulosic material by combining it with a binder which is essentially free of formaldehyde and which comprises an aqueous alkali solution of a phenol-formaldehyde resin synthesized from phenol and formaldehyde in a molar ratio between about 1:1.5 and 1:3 to have a number average molecular weight between about 700 and 3000 and which has a sodium hydroxide equivalent weight alkalinity of between about 0.5 and 15 weight percent, based on the weight of the binder, and curing the binder with the application of heat and pressure, the improvement comprising modifying the curing behavior of the binder by combining it with an accelerator selected from the group consisting of carboxylic acid esters, lactones, organic carbonates and mixtures thereof and with between about ¼ and twenty moles per mole of accelerator of a moderator which comprises an aliphatic alcohol.

18. A composition for the bonding of lignocellulosic material which is essentially free of formaldehyde comprising:

an aqueous alkali solution of a phenol-formaldehyde resin synthesized from phenol and formaldehyde in a molar ratio of between about 1:1.15 and 1:3 to have a number average molecular weight of at least about 700 and which has a sodium hydroxide equivalent weight alkalinity of between about 0.5 and 15 weight percent, based on the weight of the composition;



an amount of a curing agent selected from the group consisting of carboxylic acid esters, lactones, organic carbonates and mixtures thereof effective to accelerate the curing of the pheno-formaldehyde resin; and

an amount between about ¼ and twenty moles per mole of accelerator of a moderator selected from monohydric or polyhydric aliphatic alcohols soluble in the aqueous alkaline solution effective to slow down the room temperature curing rate of the composition while still allowing it to display an accelerated cure rate at the elevated temperatures used to consolidate wood products.

4,961,796

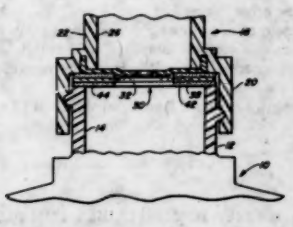
SYSTEM FOR BONDING OBJECTS TOGETHER

Patrick C. Perrin, Rancho Palos Verdes, and Jimmie L. Whittington, Diamond Bar, both of Calif., assignors to James River Corporation, Oakland, Calif.

Filed Mar. 6, 1989, Ser. No. 319,089

Int. Cl.[5] B65B *7/00*; B32B *31/00*

U.S. Cl. 156—69 **2 Claims**



1. A method of bonding a pump to the outlet structure of a container to prevent removal of said pump from said container, said outlet structure defining an opening communicating with the interior of said container, said method comprising the steps of:

positioning a securing component between said outlet struc-

ture and said pump, said securing component including a body having opposed sides and formed from electrically conductive material and a layer of thermoplastic material on each of the opposed sides of said body, said securing component being in the form of a unitary disk having an outer peripheral portion and defining an aperture, and said layers of thermoplastic material being located at said peripheral portion on both of the opposed sides of said body;

after said positioning step, bringing said outlet structure and said pump together whereby one of said layers of thermoplastic material on said outer peripheral portion is in engagement with said outlet structure and the other of said layers of thermoplastic material on said outer peripheral portion is in engagement with said pump and whereby said aperture is positioned over said opening;

while maintaining said layers of thermoplastic material in engagement with said outlet structure and said pump, generating an electromagnetic field and exposing said body to said electromagnetic field;

continuing said exposure to heat said body;

utilizing the heat of said body to cause softening and plastic flow of said thermoplastic material while said thermoplastic material layers are in engagement with said outlet structure and said pump;

during the step of utilizing the heat of said body to cause softening and plastic flow of said thermoplastic material, substantially simultaneously melting said outlet structure and said pump where said outlet structure and pump engage said layers;

terminating said exposure;

after said terminating step, cooling said body, said thermoplastic material, and the melted outlet structure and pump whereby said thermoplastic material hardens and bonds to said body, said outlet structure, and said pump to prevent relative movement therebetween.

4,961,797

METHOD FOR PROTECTING A TUBULAR METAL ARTICLE

Anthony J. Doheny, Natick, Mass., assignor to The Kendall Company, Boston, Mass.

Filed Jan. 14, 1987, Ser. No. 3,091
Int. Cl.[5] B32B *31/04*
U.S. Cl. 156—85 **6 Claims**

1. A method for protecting a tubular metal article comprising the steps of:

(1) applying a coating of a protective adhesive material over at least a portion of the outer surface of said article;

(2) winding over said applied adhesive coating the rough surface of a heatshrinkable strip of film having a rough surface and an opposed smooth surface, said film being oriented by stretching in the machine direction to increase its length by at least 10 percent, said film further being differentially crosslinked throughout its thickness, the greatest crosslinking being at or near said smooth surface, the extent of crosslinking decreasing as the distance from said smooth surface increases, said rough surface being characterized as being substantially free of crosslinking; and thereafter

(3) heating said wound heatshrinkable film to effect shrinkage thereof, whereby said film conforms tightly to said article.

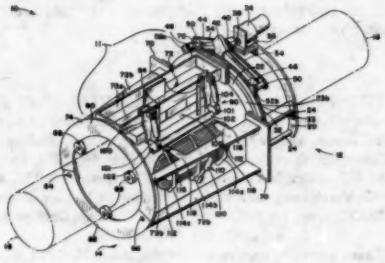
4,961,798

SLEEVE APPLICATOR ASSEMBLY FOR PIPE JOINTS

Milburn L. Hart, and Ronald E. Carlson, Sr., both of Tulsa, Okla., assignors to Commercial Resins Company, Tulsa, Okla.

Filed Oct. 2, 1989, Ser. No. 415,581
Int. Cl.[5] B29C *27/28*
U.S. Cl. 156—86 **8 Claims**

1. An apparatus for first heating a section of pipe and then wrapping a sheet of heat-shrinkable material around the pipe to cover said section, the heat-shrinkable material having an outer polyethylene side and an inner mastic side which goes against the pipe, the mastic side forming a mechanical bond to the pipe when heated and having a lower melt temperature than the shrink temperature of the material, the apparatus comprising an assembly adapted for circumferentially engaging said pipe, said assembly having an arcuate stationary frame and a rotatable fixture affixed to a portion of said frame and extending longitudinally therefrom, rotating means mounted on said frame for rotating said fixture in either direction around said pipe, a plurality of induction coil assemblies mounted spacedly on said fixture and being disposed longitudinally parallel to said pipe, whereby said fixture can be rotated around said pipe while simultaneously activating said coil assemblies to heat



said pipe to the melt temperature of the mastic, a heater assembly mounted on said fixture between a pair of said induction coil assemblies so as to be disposed directly above said section of said pipe for applying said sheet of heat-shrinkable material to said pipe immediately following the heating to said melt temperature, said heater assembly having guiding means for feeding said sheet onto the surface of said heated section and for forming a sleeve with overlapping ends as said fixture rotates around the pipe, said heater assembly having a lower temperature heater for joining the overlapping ends of said sleeve immediately following its formation; whereby the fixture can be rotated around said pipe while simultaneously activating said coil assemblies to heat said pipe to a higher shrink temperature thereby shrinking the sleeve.

4,961,799

BLIND-SIDE PANEL REPAIR METHOD

Rudy L. Cologna, Bellvue, and Melvin D. Eng, Federal Way, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 665,209, Oct. 29, 1984, Pat. No. 4,820,564.
This application Apr. 11, 1989, Ser. No. 336,200
Int. Cl.[5] B32B *7/08, 35/00*
U.S. Cl. 156—92 **11 Claims**

1. A method for blind-side repair of a panel of composite parent material comprising:

cutting the damaged section out of the composite parent material to provide a smooth sided opening of precisely known dimensions;

inserting a solid washer, a flexible washer and a plurality of fabric plies impregnated with a bonding agent on a fastener through said opening; said solid washer being slightly smaller than said opening, and said fabric plies and said flexible washer being larger than said opening;

flexing said flexible washer to allow it to pass through said opening and allowing said flexible washer to spring back to approximately its original shape after passing through said hole;

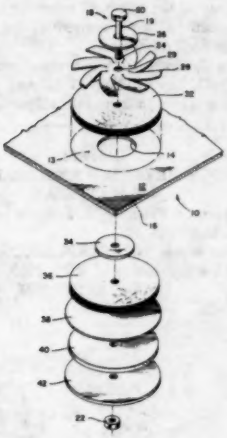
filling said hole with fill material compatible with said bonding agent;

applying a plurality of repair plies impregnated with said

bonding agent on the near-side of said composite material over said filled opening;

putting an apertured support plate on said bolt, covering said near-side plies;

screwing a nut onto said bolt and tightening said nut down against said support plate to force said support plate



against said near-side plies, and to force said flexible washer against said far-side plies;

allowing said bonding agent to cure between said flexible washer and said support plate;

after said bonding agent has cured, removing said nut and said support plate, and cutting said bolt off flush with the surface of said near-side plies.

4,961,800

NON-DUSTING WINDOW ENVELOPE FILM UTILIZING A WAXY ANTI-FLECKING AGENT

Stephen I. Foster, Bexley, and Jeffrey J. Stimler, Newark, both of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 18, 1988, Ser. No. 220,289
Int. Cl.[5] B29C *51/02*
U.S. Cl. 156—108 **8 Claims**

1. In a process for preparing and patching window envelope film, the improvement comprising: incorporating in a window envelope film composition before extrusion into a film a dust-reducing quantity of an anti-flecking agent or a combination of two or more such agents, the anti-flecking agent being a wax having a vapor pressure of less than 50 mm Hg at 350° F. and a melting point of about 90–300° F.

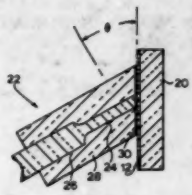
8. In a process for preparing and patching window envelope film employing a vacuum drum, the improvement comprising: incorporating in a window envelope film composition before extrusion into a film a dust-reducing quantity of an anti-flecking agent or a combination of two or more such agents, the antiflecking agent being a wax having a vapor pressure of less than 50 mm Hg at 350° F. and a melting point of about 90–300° F.

4,961,801

METHOD OF MAKING A BIDIRECTIONAL COUPLER FOR COMMUNICATION OVER SINGLE FIBER

George A. Gasparian, Roanoke, Va., assignor to Alcatel U.S.A. Corp., New York, N.Y.

Division of Ser. No. 494,135, May 16, 1983, Pat. No. 4,452,505, which is a continuation of Ser. No. 136,636, Apr. 2, 1980, abandoned. This application May 9, 1984, Ser. No. 608,610
Int. Cl.[5] B32B *31/22*
U.S. Cl. 156—153 **17 Claims**



1. A method for producing a bidirectional coupler for duplex communication over a single optical fiber comprising the steps of:

providing a glass substrate;

applying a dichroic coating upon a surface of said substrate;

processing said coated substrate into at least one dichroic wafer so that said surface is larger in area than the cross-sectional area of the optical fiber; and

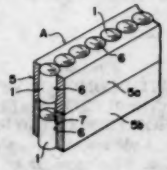
attaching an optical fiber to said surface by means of an adhesive.

4,961,802

METHOD OF MANUFACTURING A LENS ARRAY FOR READING INFORMATION

Toshinori Otsuki, Yawata, and Takuji Nakamura, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 8, 1988, Ser. No. 268,496
Claims priority, application Japan, Nov. 10, 1987, 62-283509
Int. Cl.[5] B32B *31/12*
U.S. Cl. 156—153 **3 Claims**



1. A method of manufacturing a lens array for reading information, which comprises:

forming a plurality of cylindrical lenses by forming a plurality of spheres of a single lens material and each having a spherical surface corresponding to the desired lens shape, supporting each of the spheres on revolving bolts of a revolving grinding machine at points on the surfaces of the spheres which are diametrically opposite each other, and operating the grinding machine to grind a cylindrical surface on each sphere which is concentric to the axis between the points on the surfaces of the sphere;

providing a lens holder having lens receiving openings in side by side relation;

inserting said cylindrical lenses into the lens receiving openings of the lens holder; and

mounting one lens holder above a second lens holder with

the lenses in the upper lens holder aligned with the lenses in the lower lens holder for forming the lens array.

4,961,803

THIN FILM LAMINATING METHOD AND APPARATUS

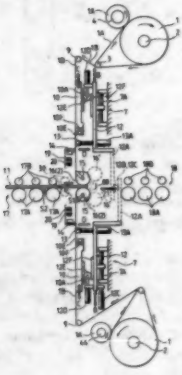
Fumio Hamamura, and Shigeo Sumi, both of Tokyo, Japan, assignors to Somar Corporation, Tokyo, Japan

Filed Apr. 4, 1989, Ser. No. 332,903

Claims priority, application Japan, Apr. 4, 1988, 63-82552; Apr. 4, 1988, 63-82553; Jun. 3, 1988, 63-137050

Int. Cl.[5] B32B *31/00, 31/04;* B44C *1/22;* C23F *1/02*

U.S. Cl. 156—238 **9 Claims**



1. A method of laminating a thin film to a base plate, in which an air bubble preventive agent is caused to cling to said plate before said plate is conveyed to a tentative sticking position in a base plate conveyance passage; the leading edge of said films is tentatively stuck to the surface of said plate at the leading edge thereof; and a pressure sticking roller is put into contact with the tentatively-stuck leading edge of said film in said position and then rotated so that said plate is conveyed and said film is completely stuck to said plate, characterized in that said agent is caused to cling to said plate before said plate is conveyed to said position; and said agent remaining on said film stuck to said plate is removed form said film, downstream to said roller.

4,961,804

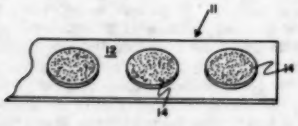
CARRIER FILM WITH CONDUCTIVE ADHESIVE FOR DICING OF SEMICONDUCTOR WAFERS AND DICING METHOD EMPLOYING SAME

Joseph A. Aurichio, Anderson, S.C., assignor to Investment Holding Corporation, Wilmington, Del.

Continuation of Ser. No. 697,424, Feb. 1, 1985, which is a continuation of Ser. No. 519,936, Aug. 3, 1983. This application Mar. 6, 1986, Ser. No. 840,461

Int. Cl.[5] B32B *31/00*

U.S. Cl. 156—248 **17 Claims**



1. A dicing film to support semiconductor wafers when they are diced into individual chips which comprises:

(a) a support film;

(b) a release layer on one side of the support film; and

(c) a pattern of curable, semiconductor chip bonding, conductive adhesive releasably affixed to the release layer on said support film, the adhesive pattern being of a size and shape to support at least one semiconductor wafer therein, the release layer allowing for pick-up of a semiconductor chip from the support film with adherent conductive adhesive without any substantial destruction of the physical integrity of the adherent adhesive.

14. A process for forming individual chips from a semiconductor wafer which comprises:

(a) attaching the wafer to the adhesive pattern carried by the dicing film of any of claims 1–11; and

(b) dicing the wafer to form said chips.

4,961,805

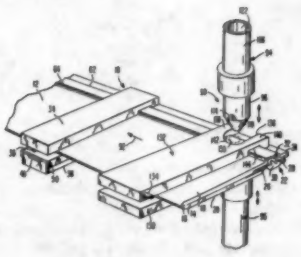
A METHOD FOR SEVERING AND SEALING SECTIONS OF MATERIAL

Lester D. Siebert, Carbondale, Ill., assignor to Com-Pac International, Inc., Centralia, Ill.

Continuation of Ser. No. 223,379, Jul. 25, 1988, Pat. No. 4,856,989. This application May 17, 1989, Ser. No. 353,041

Int. Cl.[5] B32B *31/18*

U.S. Cl. 156—251 **6 Claims**



1. A method for severing and edge sealing sections of material from a supply of stock material comprising:

moving stock material through a preheater station;

intermittently stopping the stock material in the preheater station;

clamping the stock material, while stopped, to position it with respect to preheater means in the preheater station;

moving the preheater means into contact with a portion of the stock material in the preheater station to heat and to thereby soften a portion of the stock material;

retracting the preheater means and releasing the stock material;

advancing the preheated and softened portion of the stock material to a cutting and edge sealing station for further heating and severing the stock material through the preheated portion thereof.

4,961,806

METHOD OF MAKING A PRINTED CIRCUIT

Richard W. Gerrie, Bedford, and Victor F. Dahlgren, Nashua, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Division of Ser. No. 940,479, Dec. 10, 1986, abandoned. This application Jun. 22, 1988, Ser. No. 209,827

Int. Cl.[5] B32B *31/04*

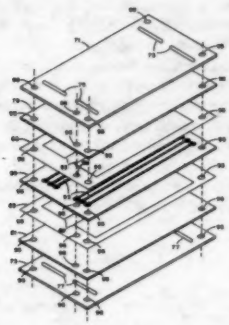
U.S. Cl. 156—252 **19 Claims**

1. A method of making a printed circuit, comprising the steps of:

forming metallic features on at least one surface of a first substrate;

forming first openings in a sheet of adhesive, before, during or after said step of forming metallic features;

forming second openings in a second substrate less flexible than the first substrate, before, during or after any of said two proceding steps; and



bonding together the first substrate, the adhesive with openings, a sheet of material impermeable to plating and etching solutions, and the second substrate.

4,961,807

METHOD OF PRODUCING GRINDING TOOL AND APPARATUS FOR PRODUCING SAME

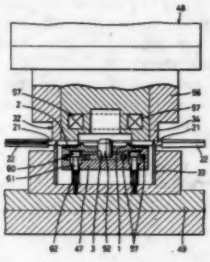
Hirokazu Ichiguchi, 3451-2, 2-chome, Gakuenmidorigaoka, Nara City, Nara Prefecture, Japan

Filed Dec. 19, 1988, Ser. No. 286,065

Claims priority, application Japan, May 14, 1988, 63-117922; Jun. 20, 1988, 63-152891

Int. Cl.[5] B20D *13/14*

U.S. Cl. 156—261 **7 Claims**



1. A method of producing a grinding tool, comprising the steps of:

providing on a receiving seat, a disk having a through hole at a center thereof and an adhesive layer on an upper surface of a circumferential edge portion thereof,

feeding forward end portions of a plurality of grinding belts distributed about the periphery of the receiving seat radially inward toward the center of the disk to predetermined positions of the disk covering the adhesive layer, such that adjacent side edges thereof overlap each other, each of the overlapping end portions of the grinding belts having a grinding particle surface on a same side thereof facing away from the adhesive layer;

pressing a pressing plate against the respective end portions of the grinding belts on the adhesive layer to adhere to the respective end portions of the grinding belts to the disk and holding the pressing plate against the end portions of the grinding belts while solidifying the adhesive layer;

cutting the grinding belts on a circular line in a vicinity of an outer circumference of the disk to separate the end portions of the grinding belts from remaining portions of the grinding belts;

separating the pressing plate from the end portions of the grinding belts and the disk after solidification of the adhesive layer; and

after said step of separating, removing the disk from the receiving seat.

4,961,808

HIGH LAMINATION SPEED AUTOMATIC LAMINATOR

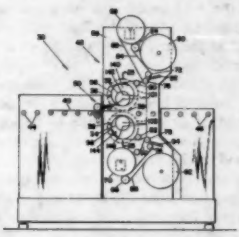
Amedeo Candore, Bodio Lomnago, Italy, assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Jun. 26, 1989, Ser. No. 371,572

Claims priority, application Italy, Aug. 26, 1988, 48305 A/88

Int. Cl.[5] B32B *31/00*; B65H *9/06*

U.S. Cl. 156—264 **22 Claims**



1. A process for laminating a film of material to a board having a face, a forward end, and a rearward end, comprising the sequential steps of:

(a) gripping the board and advancing it in a predetermined plane to position a face portion of the forward end thereof in cooperative relation with first and second surfaces that alternately are movable toward and away therefrom;

(b) supplying along a curved film guiding surface a length of film of material having a leading end with the leading end thereof held adjacent said first movable surface, said curved film guiding surface having a center of curvature that is offset with respect to an axis that is closer to the predetermined plane and is movable substantially perpendicularly toward and away from the predetermined plane;

(c) initiating movement of said first movable surface in a path substantially perpendicular to said predetermined plane to press the leading end of the film into pressure contact with the forward face portion of the board thereby to tack the leading end of the film thereto;

(d) while maintaining the board immobile, initiating movement of said first surface to effect the separation thereof from the forward face portion of the board and to effect the rotation thereof eccentrically about said axis to a waiting position and simultaneously initiating movement of the second movable surface into pressure contact with substantially the same forward face portion of the board to which the leading end of the film had been tacked; and

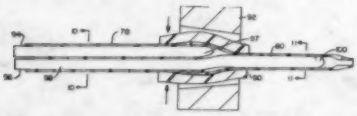
(e) advancing the board relatively to the second movable surface, with pressure contact maintained therebetween, to press the film along the length thereof to the face of the board.

4,961,809

METHOD OF PRODUCING A DUAL LUMEN CATHETER INCLUDING FORMING A FLARE

Geoffrey S. Martin, Mississauga, Canada, assignor to Vas-Cath Incorporated, Canada

Filed Apr. 21, 1988, Ser. No. 184,529
Int. Cl.[5] A61M *5/00*; **B29C** *57/00, 65/18*
U.S. Cl. 156—294 **5 Claims**



1. A method of producing a dual lumen catheter for use in a vein to remove blood to the vein through an intake lumen, and to return treated blood through a return lumen, the method comprising the steps:

providing a first portions of a thermoplastic material having a first cross-sectional area, a distal end, a proximal end, and defining first and second passageways;

providing a tubular second portion of a thermoplastic having a second cross-sectional area smaller than said first cross-sectional area, a distal end, a proximal end and an outer wall;

forming a flare at the proximal end of the second portion such that the cross-sectional area increases gradually towards the proximal end, the flare being proportioned to receive part of the first portion adjacent the distal end of the first portion;

engaging a first mandrel in the first passageway, the distal end of the mandrel being shaped in the desired shape of the distal end of an intake lumen to be formed from the first passageway, said end of the mandrel being adjacent the distal end of the first portion;

engaging a second mandrel in the second passageway and in the second portion with the distal end of the first portion engaged in said flare at a junction of the first and second portions;

applying heat and pressure to said junction to smoothly merge the distal end of the first portion and the proximal end of the second portion together to form a transition portion by causing flow of the thermoplastic material about the mandrels to close the first passageway at the transition portion thereby forming a distal end of the intake lumen in the shape of the first mandrel, and to form a second lumen shaped at the transition portion in the shape of the second lumen, the transition portion including a smooth external blending of the first and second portions continuously from said first to said second cross-sectional areas;

forming an intake aperture in the transition portion at the distal end of the intake lumen;

forming coupling means at the proximal end of the first portion to receive blood from the intake lumen and to return treated blood to the return lumen.

4,961,810

METHOD FOR THE VERTICAL MANUFACTURE OF SANDWICH STRUCTURAL ELEMENTS

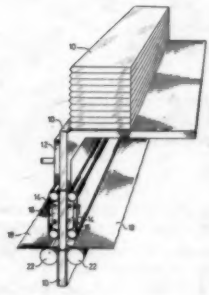
Paul Svensson, Krokusvagen 2, Laholm, Sweden, 312 31; Christer Nilson, Aleden 28, Laholm, Sweden, 312 31; Jan Bäcklund, Skyttevagen 6, Lidingo, Sweden, 181 46; Karl G. Ericsson, Verkmastargaton 62, Eskoping, Sweden, 199 33; Leif Jilkén, Blamesvagen 13, Sundsvall, Sweden, 852 55; and Harry Kihlberg, Kaptensgatan 8, Saffle, Sweden, 661 00

PCT No. PCT/SE87/00158, § 371 Date Sep. 9, 1988, § 102(e) Date Sep. 9, 1988, PCT Pub. No. WO87/05861, PCT Pub. Date Oct. 8, 1987
PCT Filed Mar. 27, 1987, Ser. No. 246,309
Claims priority, application Sweden, Mar. 27, 1986, 8601441
Int. Cl.[5] B32B *31/08, 31/12*
U.S. Cl. 156—295 **4 Claims**

1. A method of manufacturing sandwich structural elements in laminated material where a cellular core material having oppositely oriented open surface cells on opposite sides thereof is given a covering layer over each of the oppositely oriented surface cells and wherein the core material is impervious to the passage of gases therethrough and between the oppositely oriented open surface cells comprising the steps of:

a. conveying the core material generally vertically so that the open surface cells being along the opposite sides thereof are oriented generally horizontally;

b. conveying the covering layers laterally toward the open surface cells along the opposite sides of the core material and then vertically toward a flush engagement against the surface cells along the opposite side of the core material so as to form two nip areas in the regions where the covering layers engage the core material;



c. applying an excess of liquid adhesive into the nip areas in an amount which is sufficient to fill the open surface cells being conveyed through the nip areas to thereby remove any gas therefrom by allowing the liquid adhesive to expel the gas vertically from each of the surface cells so that oppositely oriented surface cells are completely filled with liquid adhesive prior to the covering layers being brought into engagement therewith; and

d. thereafter simultaneously pressing the covering layers against the core material as the liquid adhesive is hardening so as to close each of the surface cells which are completely filled with the liquid adhesive so that substantially no gas is trapped between the covering layers and the core material and the hardening takes place symmetrically on both sides of the core material.

4,961,811

AFFIXABLE - DETACHABLE PAPER AND METHOD OF USING IT

Rudiger D. Haugwitz, 5803 Walton Rd., Bethesda, Md. 20817

Filed Dec. 14, 1988, Ser. No. 284,415
Int. Cl.[5] B32B *31/18, 7/14*
U.S. Cl. 156—344 **14 Claims**

1. A first paper that can be adhesively secured to a second paper from which the first paper can be removed substantially intact, comprising a first paper having a single dot or line or a plurality of dots or lines of an adhesive disposed at a nonessential portion of the first paper, the first paper being removable

substantially intact from second paper to which said first paper is securely attached by said adhesive, wherein said

single dot or line or plurality of adhesive dots or lines are protected by protecting means other than paper.

4,961,812

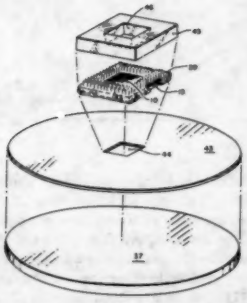
ETCH-BACK APPARATUS FOR INTEGRATED CIRCUIT FAILURE ANALYSIS

William Baerg, Palo Alto, and Valluri R. M. Rao, Milpitas, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Sep. 13, 1988, Ser. No. 243,787

Int. Cl.[5] H01L *21/308*

U.S. Cl. 156—345 **14 Claims**



1. An apparatus for etching a dielectric layer of an integrated circuit device in combination with said integrated circuit device and a plasma etching chamber having at least two electrodes having a difference in potential, comprising

electrical coupling means wherein said coupling means is coupled to a plurality of terminals of said integrated circuit device and is also coupled to one of said electrodes;

a plate disposed on said one of said electrodes between said two electrodes of said plasma etching chamber such that said integrated circuit device is disposed upon said plate and wherein said plate is formed from an etch-resistant material;

a cover having a centered opening throughout placed atop said integrated circuit device to cover said integrated circuit device such that said integrated circuit device is demountably positioned on said plate and said cover partially covers said integrated circuit device wherein a portion of said integrated circuit device not covered is exposed to a plasma etching process.

4,961,813

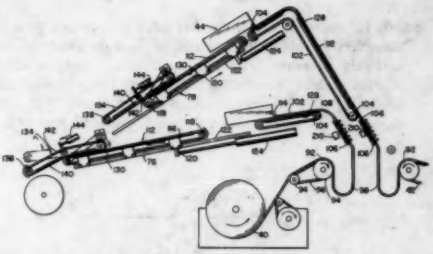
SERVICER FOR TIRE BUILDING MACHINE

David W. Bailey, Waterloo, Canada, assignor to The Uniroyal Goodrich Tire Company, Akron, Ohio

Filed May 26, 1988, Ser. No. 198,888

Int. Cl.[5] B29D *30/44*

U.S. Cl. 156—406.4 **12 Claims**



1. A servicer for conveying upper and lower breaker strip material onto a rotating cylindrical surface comprising:

upper and lower conveyors, each with an input end and output end, to sequentially feed the upper and lower breaker strip material along upper and lower paths of travel onto the rotating cylindrical surface; each conveyor including an input conveyor portion, an intermediate conveyor portion and an output conveyor portion, each portion including a separate conveyor belt, the input and intermediate conveyor portions having agents beneath their conveyor belts for conveying fed material thereabove and the output conveyor portion having magnets thereabove for conveying fed material therebeneath;

a roll of breaker strip material located in association with each conveyor at its input end;

first positioning means to move the intermediate and output conveyor portion of each conveyor longitudinally along the feed path between a first extended position adjacent to the rotating cylindrical surface and a second position remote therefrom;

second positioning means to pivot only the output end of the output conveyor portion of each conveyor in said first extended position between a raised inoperative position and a lowered position in operative association with the rotating cylindrical surface;

cutter means in each path of travel to cut the conveyed breaker strip material into strips of predetermined lengths; and

drive means associated with the conveyors to move the cut breaker strip material onto the rotating surface.

4,961,814

PROCESS AND APPARATUS FOR THE APPLICATION OF A NON-ADHESIVE INSULATING TAPE TO AN ELECTRIC COIL WINDING

Ernst Arnold, Buchs, Switzerland, assignor to Meteor AG, Ruschlikon, Switzerland

Division of Ser. No. 175,258, Mar. 30, 1988, Pat. No. 4,869,763. This application Apr. 28, 1989, Ser. No. 344,604

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710639

Int. Cl.[5] B32B *31/00*

U.S. Cl. 156—446 **3 Claims**

1. Apparatus for the application of a nonadhesive strip to a coil form of an electrical coil, comprising:

a first supply roll;

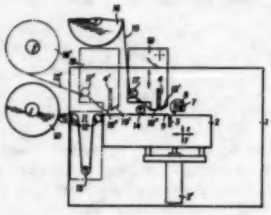
a pressure head;

means for drawing a first piece of a single sided adhesive tape from said first supply roll and for conducting the first piece of adhesive tape from one side onto a first contact surface of the pressure head;

means for moving said pressure head into a first working position relative to a coil, with said first contact surface against a completed winding of the coil to bond and wind the first piece of adhesive tape on the coil;

means for cutting the adhesive tape while leaving one end free, said pressure head moving means subsequently moving the pressure head away from the coil into a rest position, after which said coil is further rotated by one-half turn;

means for moving a counter holder into contact with the nonadhesive side of the free end of the adhesive tape, such that said pressure head moving means moves a second contact surface, to which from another side a nonadhesive insulating strip is applied from a second supply roll, into a second working position relative to the coil and presses



against the counter holder to adhesively bond said nonadhesive insulating strip serving as intermediate, cover and/or shielding insulation to the free end of the adhesive tape; and,

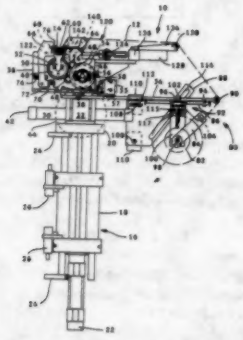
means for cutting an end of the nonadhesive insulating strip following a winding of a predetermined number of turns of said nonadhesive insulating strip on the coil, after which said pressure head moving means returns the pressure head into its first working position, in which it presses with its first contact surface against the coil, to adhesively bond the end of the insulating strip to a second piece of adhesive tape drawn from the first supply roll and resting on the second contact surface, said second adhesive tape being bonded to the coil upon a further turn of said coil and then cut.

4,961,815

TAPE WRAPPING APPARATUS FOR WRAPPING A BUNDLE OF WIRES

Richard A. Buckley, Camp Hill, and Kenneth F. Folk, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 27, 1989, Ser. No. 303,440
Int. Cl.[5] B31F *1/00*
U.S. Cl. 156—468 **9 Claims**



1. In a machine for handling a bundle of wires, an apparatus for automatically wrapping a tape about said bundle of wires comprising:

(a) a frame;

(b) a tape wrap head journaled for rotation in said frame and movable therewith in a direction toward and into engagement with said bundle of wire and in an opposite direction;

(c) an endless supply of tape;

(d) a tape handling means for dispensing a selected length of tape from said endless supply of tape while maintaining a desired tension on said tape including means for providing slack tape and means for storing slack tape;

(e) cutter means for cutting said selected length of tape leaving a free cut end on said endless supply of tape;

wherein said means for providing slack tape comprises:

(1) a slide having a stationary portion attached to said frame and a movable portion having a bracket attached thereto;

(2) a tape reel journaled for rotation in said bracket and arranged for holding said endless supply of tape;

(3) a first tape pivot on said bracket and a second tape pivot on said stationary portion of said slide arranged so that the distance between said first and second tape pivots varies as said movable portion of said slide undergoes movement along said stationary portion; and

(4) means for effecting said movement of said movable portion so that when a length of tape from said endless supply of tape is disposed about said first and second tape pivots and the distance therebetween is reduced, said slack tape is thereby provided,

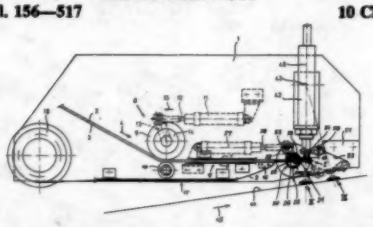
wherein said tape wrap head is operable to wrap said cut selected length of tape about said bundle of wires.

4,961,816

APPARATUS FOR EMPLACING SPACERS

Peter Lisec, Bahnhofstrasse 34, A-3363 Amstetten-Hausmenig (NO), Austria

Filed Feb. 23, 1989, Ser. No. 313,880
Claims priority, application Austria, Mar. 25, 1988, 801/88
Int. Cl.[5] B32B *31/18*
U.S. Cl. 156—517 **10 Claims**



1. In apparatus for emplacing spacer shims (**21**) on glass panes, comprising a storage reel for a strip (**2**) of spacing material covered on one side with an adhesive coating, this coating being covered by a protective film (**3**); a drive mechanism for conveying the strip (**2**) to a cutting unit (**20**); a pressure-applying means provided following the cutting unit (**20**) for the spacer shims (**21**), cut to size from the strip (**2**) by means of the cutting unit (**20**), the pressure-applying means (**40, 41**) comprising a suction cup (**40**) for seizing the spacer shims (**21**), arranged in an initial position (I) on a delivery side of the cutting unit (**20**), and means to advance said suction cup toward a surface (**44**) of a glass pane that faces said suction cup and to which a spacer shim (**21**) is to be attached; the improvement wherein the last-named means comprises a piston rod (**41**) of a preasure medium cylinder (**42**) pivotably (axis **43**) mounted on the apparatus and oriented perpendicularly to said surface.

4,961,817

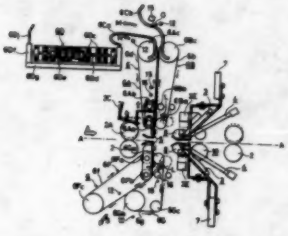
THIN-FILM RELEASING APPARATUS

Mitsuhiro Seki, Tokyo, Japan, assignor to Somar Corporation, Tokyo, Japan

Filed Dec. 13, 1988, Ser. No. 283,774
Claims priority, application Japan, Dec. 14, 1987, 62-315552
Int. Cl.[5] B32B *31/18*
U.S. Cl. 156—584 **12 Claims**

1. A thin-film releasing apparatus applicable to the manufacture of printed circuit boards by a process in which a substrate

containing a thin film is conveyed in a conveyance direction and a portion of said thin film is released from a surface of said substrate on which said thin film is stuck, the remaining portion of said thin film is then released starting from said released portion thereof, and said released thin film is then removed, said apparatus comprising: a first thin-film conveyance system for releasing the remaining portion of said thin film from said substrate by nipping said thin film at said initially released



portion thereof and for conveying said released thin film upward from said surface of said substrate while nipping said thin film, and a second thin-film conveyance system for mounting thereon said thin film conveyed by said first thin-film conveyance system and for conveying said mounted thin film in a direction intersecting said conveyance direction of said substrate, in a plane substantially parallel to said surface of said substrate.

4,961,818

PROCESS FOR PRODUCING SINGLE CRYSTALS

Raymond C. Benn, Huntington, W. Va., assignor to Inco Alloys International, Inc., Huntington, W. Va.

Filed Jun. 21, 1985, Ser. No. 747,292

The portion of the term of this patent subsequent to Feb. 13, 2007, has been disclaimed.

Int. Cl.[5] C30B *28/04*

U.S. Cl. 156—603 **6 Claims**

1. A process for producing a single crystal object made of dispersion strengthened, gamma prime strengthened nickel-base alloy comprising providing a recrystallizable polycrystalline, dispersion strengthened gamma prime strengthened, gamma phase nickel-base alloy mass at least as large as the single crystal object to be produced, providing a single crystal seed object made of a gamma phase nickel-base alloy closely matching in gamma phase lattice parameters the gamma phase lattice parameters of said dispersion strengthened, gamma prime strengthened gamma phase nickel-base alloy in the solution treated condition, preparing essentially oxidic and carbidic contaminant-free closely fitting faying surfaces on said single crystal seed object and on said alloy mass, diffusion bonding said seed object to said alloy mass at said faying surfaces while maintaining static pressure normal to said faying surfaces sufficient to produce a total deformation of about 1-3%, zone annealing said bonded object in the absence of a molten phase to epitaxially grow a single crystal from said bonded joint into said alloy mass, said zone annealing being characterized by relative motion between said bonded object and a localized steep gradient thermal energy source having an intensity sufficient to raise the local temperature of said bonded object above the solvus temperature of the gamma prime phase in said alloy mass to thereby provide a single crystal at the expense of the existing polycrystalline structure and thereafter, if necessary discarding the seed single crystal and excess metal of said mass to provide a single crystal dispersion strengthened, gamma prime-containing, gamma phase nickel-base alloy object of controlled orientation.

4,961,819

SYNTHESIS IN FLUX OF CRYSTALS AND EPITAXIES FROM FROM ISOTYPIC SOLID SOLUTIONS OF $KTIOPO_4$

Gérard Marnier, Jarville, France, assignor to Centre National de la Recherche Scientifique, Paris, France

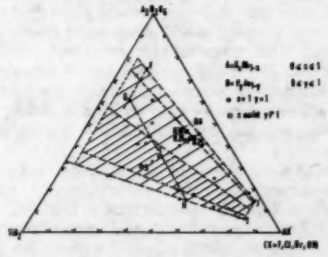
Continuation of Ser. No. 146,928, Jan. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 889,777, Jul. 28, 1986, Pat. No. 4,746,396. This application Jul. 24, 1989, Ser. No. 384,105

Claims priority, application France, Jan. 23, 1987, 87 00811

The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.

Int. Cl.[5] C30B *9/12*

U.S. Cl. 156—623 R **8 Claims**



1. A process for the synthesis in flux of crystals and epitaxies from KTP or from isotypic solids solutions thereof having the following formula: $K_aRb_{1-a}TiOP_bAs_{1-b}O_4$ in which $0 \leq a \leq 1$ and $0 \leq b \leq 1$ comprising combining in a crucible (a) titanium oxide, (b) oxides, oxide precursors or salts of the metal constituents of said $K_aRb_{1-a}TiOP_bAs_{1-b}O_4$ compound and introducing said crucible into a furnace, wherein

a flux composition is formed in said crucible by adding to (a) and (b) a derivative of K or Rb selected from hydroxides or halogenides,

the flux composition is at a pressure near the atmospheric pressure is brought to a temperature of about 600° C. to 800° C. for about 25 to 100 hours using a furnace containing said crucible to obtain a thermal gradient such that the temperature decreases from the bottom to the top of the crucible,

the stage temperature is maintained or cooled at 1° to 5° C. C/h,

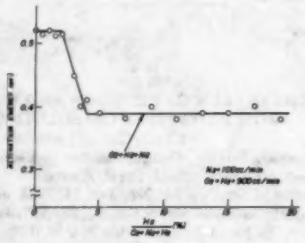
the crystals are separated from the vitreous material formed during the process with the proviso that when an halogenide of K or Rb is added to the flux composition, the initial composition of said flux composition is included into the pseudoternary diagram $A_nB_2O_6$, TiO_2, AX in which n varies from 2 to 4, $A=K_xRb_{1-x}$ with $0 \leq x \leq 1$ and $B=P_yAs_{1-y}$ with $0 \leq y \leq 1$ and X=F, Cl, Br.

4,961,820

ASHING METHOD FOR REMOVING AN ORGANIC FILM ON A SUBSTANCE OF A SEMICONDUCTOR DEVICE UNDER FABRICATION

Keisuke Shinagawa, Kawasaki; Shuzo Fujimura, Tokyo, and Kenichi Hikazutani, Kuwana, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 5, 1989, Ser. No. 361,178
Claims priority, application Japan, Jun. 9, 1988, 63-142673
Int. Cl.[5] H01L *21/302*; B44C *1/22*
U.S. Cl. 156—643 7 Claims



1. A method for removing an organic material formed on a ground substance of a semiconductor device, comprising the steps of:

providing a mixed reactant gas comprising oxygen, water vapor and an additional gas in a proportion relative to each other such that upon forming said mixed gas into a plasma and impinging said plasma upon a surface containing said organic material to be ashed under ashing conditions, the ashing rate is higher than it would be if the reactant gas was composed of only oxygen and water and the activation energy is lower than it would be if the reactant gas was composed of only oxygen and water vapor;

generating a first plasma of said mixed reactant gas

providing a second plasma down stream of said first plasma for producing active species thereof; and

impinging said second plasma on said organic material down stream from the making of said first plasma for a time and under condition sufficient to ash said organic material but insufficient to attack said ground substance.

4,961,821

ODE THROUGH HOLES AND BUTT EDGES WITHOUT EDGE DICING

Donald J. Drake, Rochester; William G. Hawkins; Michael R. Campanelli, both of Webster, and Thomas A. Tellier, Williamson, all of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed Nov. 22, 1989, Ser. No. 440,296
Int. Cl.[5] H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—647 33 Claims

1. A method of fabricating at least one through opening of predetermined dimensions in a (100) silicon wafer by orientation dependent etching after completion of integrated circuits on the wafer, the opening extending through the wafer between a circuit surface of the wafer and an opposite parallel base surface of the wafer and having a predetermined location relative to the integrated circuit on the circuit surface of the wafer, the method comprising the steps of:

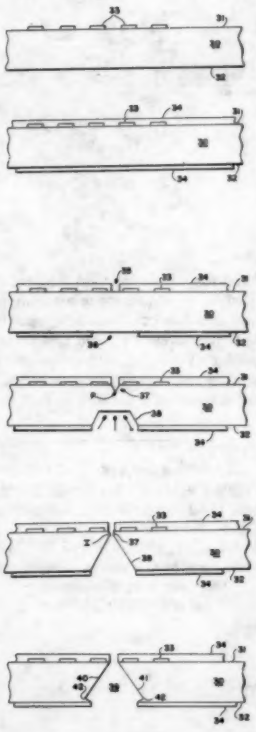
fabricating the integrated circuit on the circuit surface of the wafer;

applying an etch resistant layer of plasma silicon nitride on the circuit and base surfaces of the wafer;

patterning the etch resistant plasma silicon nitride layer on the circuit surface to define an upper etch opening having a location and dimensions which define the predetermined location and dimensions of the through opening;

patterning the plasma silicon nitride layer on the base surface to produce a lower etch opening aligned with the upper etch opening within a predetermined tolerance; and

anisotropic etching the wafer to produce a first recess corresponding to the upper etch opening in the circuit surface



and a second recess corresponding to the lower etch opening in the base surface, each of the first and second recesses being bounded by (111) plane side walls, the anisotropic etching of the second recess intersecting the first recess to form the through opening bounded by (111) plane side walls and having its predetermined dimensions and location defined by the patterning of the upper etch opening.

4,961,822

FULLY RECESSED INTERCONNECTION SCHEME WITH TITANIUM-TUNGSTEN AND SELECTIVE CVD TUNGSTEN

Kuan Y. Liao, 3932 Capri; Yu C. Chow, 4901 Flagstar, both of Irvine, Calif. 92714; Maw-Rong Chin, 19172 Homestead La., Huntington Beach, Calif. 92646, and Charles S. Rhoades, 1711 Huntington St. #4, Huntington Beach, Calif. 92648

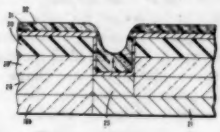
Filed Apr. 17, 1989, Ser. No. 338,681
Int. Cl.[5] H01L *21/306*; B44C *1/22*; C03C *15/00*; C23F *1/02*
U.S. Cl. 156—656 20 Claims

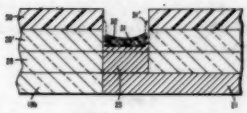
1. A method of fabricating higher-order metal interconnection layers in a multi-level metal semiconductor device having at least one metal interconnection layer, an oxide layer disposed on the metal interconnection layer, and a metal plug

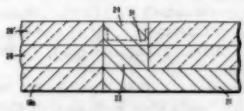
disposed in the oxide layer connected to the metal interconnection layer, said method comprising the steps of:

forming a reverse photoresist mask on the oxide layer having trenches therein that define a higher-order metal interconnection layer;

depositing an adhesion layer on top of the photoresist mask that contacts the metal plug;







depositing a low viscosity photoresist layer on top of the adhesion layer;

anisotropically etching the adhesion layer and low viscosity photoresist layer;

removing the low viscosity photoresist layer to expose the adhesion layer; and

depositing selective metal on top of the adhesion layer to form the higher-order metal interconnection layer.

4,961,823

METHOD OF MANUFACTURING CALCIUM CARBONATE SINGLE CRYSTAL

Shinichi Hirano, 123, Meidai Yada-cho Syukusha, 66, Yada-cho 2-chome, Higashi-ku, Aichi-ken; Ryo Toyokuni, and Hiroshi Kuroda, both of Tokyo, all of Japan, assignors to Shinichi Hirano and Seiko Instruments & Electronics Ltd., both of, Japan

Continuation-in-part of Ser. No. 924,402, Oct. 29, 1986, Pat. No. 4,762,588. This application Jan. 20, 1988, Ser. No. 146,294

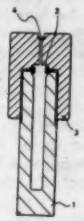
Claims priority, application Japan, Nov. 12, 1985, 60-253124; Mar. 17, 1987, 62-61942; Apr. 23, 1987, 62-100470; Oct. 13, 1987, 62-257762

The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.

Int. Cl.[5] C30B *29/10, 7/10*

U.S. Cl. 156—623 R **18 Claims**

1. A method of manufacturing calcium carbonate single crystal wherein the calcium carbonate single crystal is grown by hydrothermal synthesis which applies heat and pressure to a starting material composed of calcium carbonate crystal within a nitrate aqueous solution at a temperature and pressure



effective to grow the calcium carbonate single crystal, said nitrate being either $Ca(NO_3)_2$ or NH_4NO_3.

4,961,824

METHOD FOR MANUFACTURING MULTILAYER BOARD

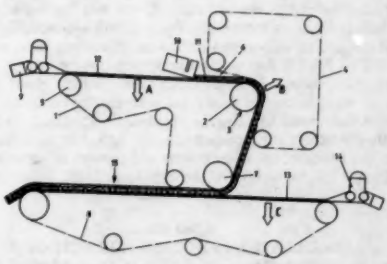
Leo S. Laitinen, Niiditnkuja 5, Huutjärvi, Finland (SF-49210), and Veikko K. T. Waris, Rimmonkatu 17, Kyminlinna, Finland (SF-48700)

Continuation of Ser. No. 822,433, Dec. 17, 1985, abandoned. This application Jan. 13, 1989, Ser. No. 298,237

Claims priority, application Finland, May 11, 1984, 841895

Int. Cl.[5] D21F *11/04*

U.S. Cl. 162—123 **3 Claims**



1. A method for manufacturing three-layer paperboard web comprising the following steps:

providing a high-consistency headbox and two low-consistency headboxes;

feeding a low-consistency pulp suspension from one of the low-consistency headboxes onto a first, inner wire thereby forming a first surface layer on said first wire;

subsequently feeding a high-consistency pulp suspension from the high-consistency headbox onto the top surface of said first surface layer in or in front of a tapering gap formed by the first wire and a second outer wire, the first wire, between the feed form said high-consistency headbox and said gap, being unsupported by underlying structure;

guiding both of said first and second wires with said first surface layer and said intermediate layer between said first and second wires pressing the wires together and over a dewatering roll so as to dewater said intermediate layer in a direction away from said top surface layer;

detaching said second wire from said intermediate layer directly upon said layers leaving said dewatering roll, and subsequently;

feeding a low-consistency pulp suspension from the other low-consistency headbox onto a third wire thereby forming a second surface layer;

guiding the first wire and both said first surface layer and said intermediate layer against said third wire onto which the second surface layer of low-consistency pulp suspension has been supplied;

wherein the pulp suspension forming the intermediate layer and supplied from the high-consistency headbox has a consistency of 1.5% to 10% and the pulp suspensions forming the first and second surface layers and supplied from low-consistency headboxes, respectively, have consistencies of 0.1% to 1.0%; and

dewatering both low-consistency pulp suspensions on the respective first and third wires prior to contacting the low-consistency suspensions with the high-consistency suspension of the intermediate layer, the web layers being bonded to one another on a horizontal section of the third wire.

4,961,825

PAPERMAKING PROCESS

Kjell R. Andersson, Kirland, Canada; Bernt Larsson, Backa, Sweden; Hans-Olof Thoresson, and Bo V. Larsson, both of Partille, Sweden, assignors to Eka Nobel AB, Surte, Sweden

Continuation of Ser. No. 128,457, Dec. 3, 1987, abandoned, which is a continuation of Ser. No. 841,524, Feb. 5, 1986, abandoned. This application Sep. 22, 1989, Ser. No. 411,241

Claims priority, application Sweden, Jun. 7, 1984, 8403062

Int. Cl.[5] D21H *17/24, 17/74*

U.S. Cl. 162—175 **13 Claims**

1. A paper making process comprising forming and drying of an aqueous paper pulp containing cellulosic fibers wherein anionic and cationic components are separately added to the aqueous paper pulp prior to forming the paper, said anionic component being added as a sol comprising colloidal anionic particles having a size less than 20 nm and having at least a surface layer of aluminum silicate or aluminum-modified silicic acid containing silicon and aluminum atoms in a ratio of about 9.5:0.5 to 7.5:2.5, and said cationic component comprising at least one cationic or amphoteric carbohydrate comprising a starch, amylopectin or guar gum, wherein the cationic component is cationized to a degree of substitution of 0.01 to 1.0 and further wherein the components are added in amounts such that the solids of the components are present in an amount of at least 0.1% by weight of the cellulosic fiber.

4,961,826

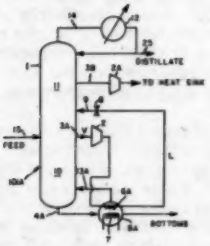
DISTILLATION PROCESS FOR ETHANOL

Hans E. Grethlein, Hanover, and Lee H. Lynd, Meriden, both of N.H., assignors to Trustees of Dartmouth College, Hanover, N.H.

Division of Ser. No. 829,549, Feb. 13, 1986, Pat. No. 4,626,321, which is a continuation of Ser. No. 525,102, Aug. 22, 1983, abandoned. This application Aug. 19, 1986, Ser. No. 897,986

Int. Cl.[5] B01D *3/40*; C12P *7/06*

U.S. Cl. 203—19 **1 Claim**



1. In a method for separating an aqueous ethanol mixture to produce high purity ethanol in an apparatus comprising a distillation column, an evaporator and an extractive distillation column wherein a suitable salt is added to the extractive distillation column to eliminate an azeotrope between water and ethanol thereby increasing the relative volatility of ethanol and wherein the salt is thereafter recovered by evaporation in the evaporator, the improvement wherein a vapor stream is withdrawn from a point in said distillation column having a temperature intermediate between the highest and lowest temperatures in said distillation column for use as a heat source for transferring heat to a heat-sink liquid having a temperaure at the system pressure higher than the temperature of said withdrawn vapor stream at the system pressure, the flow rate of the withdrawn vapor stream having an upper limit which causes the distillation column to be pinched at the return point and a lower limit which provides significant changes in the internal reflux ratio at the point of return for the withdrawn vapor stream and thereafter performing work on vapor resulting from said withdrawn vapor stream to raise the condensation temperature of said vapor above the evaporation temperature of said heat-sink liquid and condensing at least a portion of said vapor resulting from the withdrawn vapor stream and returning the condensed liquid stream to the distillation column at a point having a higher temperature than the temperature at its point of withdrawal.

4,961,827

OBTAINING VERY PURE MALEIC ANHYDRIDE FROM CRUDE MALEIC ANHYDRIDE

Dieter Zimmerling; Johannes E. Schmidt, both of Ludwigshafen; Rolf Seubert, Frankenthal; Karl Fischer, Hohen-Sueizen, and Friedrich Sauer, Obersuelzen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 22, 1986, Ser. No. 821,409

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1985, 3504146

Int. Cl.[5] B01D *5/00*

U.S. Cl. 203—87 **4 Claims**

1. In a process for the fractional distillation of a crude maleic anhydride in a column wherein the low boiling impurities are removed from the top of the column, the high boiling impurities are removed from the bottom of the column, and a purified maleic anhydride is withdrawn from the middle of the column as a vapor stream containing not less than 98% by weight of maleic anhydride, the method of improving the purity and color stability of the withdrawn maleic anhydride which comprises:

partially condensing the withdrawn vapor stream of maleic anhydride such that about 0.5 to 15% by weight of said vapor stream is condensed and separated from the vapor phase as a liquid precondensate, and then condensing the remaining portion of said vapor stream to recover a maleic anhydride of improved purity and color stability.

4,961,828

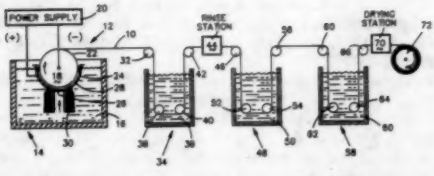
TREATMENT OF METAL FOIL

Lifun Lin, Hamden, and Ned W. Polan, Madison, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Apr. 5, 1989, Ser. No. 333,212

Int. Cl.[5] C25D *5/34, 7/06*

U.S. Cl. 204—27 **31 Claims**



1. A process of treating metal foil comprising applying an

aqueous chromic acid solution to said foil, said solution having a concentration of chromic acid in the range of about 0.002 g/l to about 1.0 g/l and thereafter forming a plurality of copper or copper oxide dentritic or nodular structures on at least one surface of said foil.

4,961,829

PASSIVATION OF SEMICONDUCTOR SURFACES

Nili Mainzer, Haifa; Eliezer Weiss, Ramat Yishay Settlement, and Leah Carmiel, Kiryat Bialik, all of Israel, assignors to Semi-Conductor Devices, a Tadiran-Rafael Partnership, D. N. Misgav, Israel

Filed Sep. 30, 1988, Ser. No. 251,813
Int. Cl.[5] C25D *9/06*; B32B *9/00*
U.S. Cl. 204—34.5 6 Claims

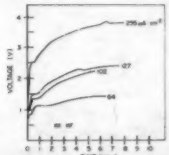
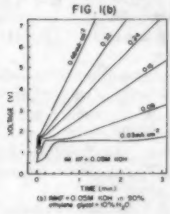


FIG. 1(b)



1. A process for the passivation of surfaces of semi-conductors of mercury-cadmium-telluride, which comprises subjecting such semi-conductors to surface anodization in a bath comprising a fluoride in an organic solvent or in an organic solvent/water mixture, resulting in a fluorine-containing surface film.

4,961,830

METHOD OF INHIBITING ADHESION OF BY-PRODUCT INSIDE DUCT IN TREATMENT OF WASTE GAS BY ELECTRON BEAM IRRADIATION

Shinji Aoki, Tokyo, and Akihiko Maezawa, Yokohama, both of Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Oct. 18, 1988, Ser. No. 259,537
Claims priority, application Japan, Oct. 30, 1987, 62-273553
Int. Cl.[5] B01D *53/34*; G21K *5/00*
U.S. Cl. 204—157.3 8 Claims

1. A method for inhibiting adhesion of a waste gas treatment by-product inside a duct, said waste gas containing components such as SO_x and NO_x, comprising the steps of:

adding ammonia to said waste gas;

irradiating said waste gas with electron beams; and

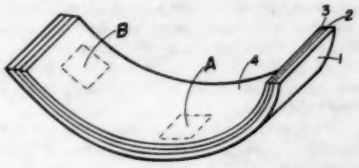
after irradiating, feeding said waste gas from a reactor through said duct at a flow velocity such that substantially no deposition of said by-product occurs but no more than 10 m/sec until said waste gas reaches a first by-product collector.

4,961,831

COMPOSITE MATERIAL HAVING A SLIDE LAYER APPLIED BY CATHODE SPUTTERING

Erich Bergmann, Mels, Switzerland, and Jurgen Braus, Walldorf, Fed. Rep. of Germany, assignors to Balzers Aktiengesellschaft, Fürstentum, Liechtenstein

Division of Ser. No. 136,295, Dec. 22, 1987, Pat. No. 4,889,772.
This application Oct. 25, 1989, Ser. No. 427,326
Int. Cl.[5] C23C *14/34*
U.S. Cl. 204—192.16 15 Claims



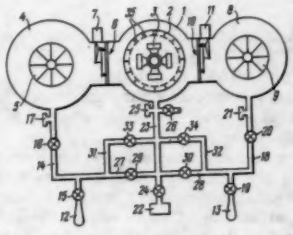
1. A method of manufacturing a composite material, comprising the steps of: applying by cathode sputtering a slide layer surface of a mixture of particles deposited in a substantially predetermined distribution of at least one cohesive metallic material forming a matrix and at least one additional metallic material in the solid state, said additional metallic material defining particles, substantially insoluble in the matrix material; and, generating mean particle diameter gradients of said particles to provide locations of particles of small mean diameter, of high hardness and good load bearing ability, and to provide locations of particles of larger mean diameter with a lower degree of hardness, of good embedding capacity.

4,961,832

APPARATUS FOR APPLYING FILM COATINGS ONTO SUBSTRATES IN VACUUM

Vladimir A. Shagun, ulitsa 50 let SSSR, 14, kv. 63; Vladimir A. Domrachev, ulitsa Sotsialisticheskaya, 47, kv. 64; Pavel S. Balykin, ulitsa Entuziastov, 1, kv. 212; Jury V. Sokolov, ulitsa Kirova, 41, kv. 63; Vitaly E. Lisitsyn, ulitsa Malo-lesopilnaya, 25, and Vladimir P. Petrakov, ulitsa M. Rylskogo, 6/1, kv. 185, all of Ufa, U.S.S.R.

Filed Mar. 14, 1989, Ser. No. 323,560
Int. Cl.[5] C23C *14/34*
U.S. Cl. 204—298.07 4 Claims



1. An apparatus for applying film coatings onto substrates in vacuum, comprising:

a vacuum working chamber;

a holder of substrates to be coated, accommodated in said vacuum working chamber;

at least one unit for magnetron sputtering of materials of the coatings, arranged in said working chamber for the materials sputtered thereby to be deposited as films on said substrates held by said holder;

a main evacuation chamber in communication with said working chamber through a first control valve means;

a main magnetron pump arranged in said main evacuation chamber to evacuate gases from the chamber;

a first gas source in communication with the main evacuation chamber by a first conduit means having a first valve means;

a pre-evacuation pump in communication with the working chamber through a second conduit means having a second valve means;

an auxiliary evacuation chamber in communication with said working chamber through a second control valve means;

an auxiliary magnetron pump arranged in said auxiliary evacuation chamber to evacuate gases from the chamber;

a second gas source in communication with the auxiliary evacuation chamber by a third conduit means having a third valve means;

the first gas source in communication with the second conduit by a forth conduit means having a fourth valve means; and

the second gas source in communication with said second conduit through a fifth conduit having a fifth valve means.

4,961,833

FIELD-EFFECT TRANSISTOR-TYPE SEMICONDUCTOR SENSOR

Tadashi Sakai, Kanagawa; Shigeki Uno, Tokyo; Masao Koyama, and Nanao Nakamura, both of Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 23, 1989, Ser. No. 327,817

Claims priority, application Japan, Mar. 31, 1988, 63-78715

Int. Cl.[5] G01N *27/30, 27/327*

U.S. Cl. 204—403 **30 Claims**

1. A field-effect transistor-type semiconductor sensor comprising:

a first semiconductor substrate;

a second semiconductor substrate bonded directly to said first semiconductor substrate interposing an oxide film therebetween;

a source region, a channel region and a drain region, each being provided in said first semiconductor substrate;

a first insulating film on said first semiconductor substrate;

a second insulating film on said first insulating film, said second insulating film being sensitive to a specified ion; and

a source electrode and a drain electrode, each being connected to a corresponding one of said source and drain regions through said second semiconductor substrate.

4,961,834

ELECTROCHEMICAL MEASURING CELL FOR AMPEROMETRICALLY DETERMINING AMMONIA AND DERIVATIVES THEREOF

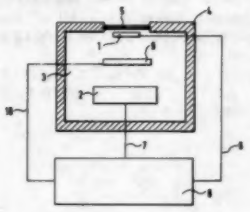
Uwe Kühn, Wesenberg; Christiane Roocks, Bad Schwartau, and Herbert Kiesele, Lübeck, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Dec. 11, 1989, Ser. No. 448,269

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1988, 3841622

Int. Cl.[5] G01N *27/31*

U.S. Cl. 204—412 **10 Claims**



1. An electrochemical measuring cell for determining the content of ammonia and the derivatives thereof in a fluid measuring sample, the measuring cell comprising:

a housing having an opening directed toward the sample to be measured and defining an electrolyte chamber;

a permeable membrane mounted on said housing for closing off said chamber;

an anode and a cathode disposed in said chamber so as to be in spaced relationship to each other; and,

a non-oxidizable soluble reagent contained in said electrolyte for completely reacting with ammonia while forming an oxidizable product which oxidizes into non-oxidizable, soluble, chemically and electrochemically inert secondary products.

4,961,835

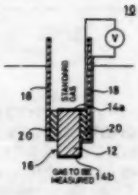
SOLID ELECTROLYTE, SENSOR THEREWITH AND METHOD OF MAKING SAID SENSOR

Shouzo Kobayashi; Hiroshi Takagi, and Yukio Sakabe, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 29, 1989, Ser. No. 330,603

Int. Cl.[5] G01N *27/409*

U.S. Cl. 204—427 **13 Claims**



3. An oxygen sensor chip for use in an oxygen sensor, said chip being formed from a solid electrolytic substance comprising yttrium oxide (Y_2O_3), silicon dioxide (SiO_2) and zirconium oxide (ZrO_2), in which when represented by a general formula of $aY_2O_3.bSiO_2.(1\text{-}a\text{-}b)ZrO_2$, a and b are respectively within a range of:

$0.012 \leq a \leq 0.109$ and;

$0.129 \leq b \leq 0.385$.

11. A method of manufacturing an oxygen sensor chip for use in an oxygen sensor comprising the steps of:

forming an elongated element having opposite end faces from a solid electrolytic substance including yttrium oxide (Y_2O_3), silicon dioxide (SiO_2) and zirconium oxide (ZrO_2) in which when represented by a general formula of $aY_2O_3.bSiO_2.(1-a-b)ZrO_2$, a and b are respectively within a range of:

$0.012 \leqq a \leqq 0.109$ and;

$0.129 \leqq b \leqq 0.385$;

forming an electrode on each of said opposite end faces; and forming said elongated element on an end of an elongated non-electrolytic ceramic member.

4,961,836

SYNTHESIS OF TRANSITION METAL ALUMINO-SILICATE IOZ-5 AND USE OF IT FOR HYDROCARBON CONVERSION

William J. Murphy, Brights Grove, Canada, assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 866,305, May 23, 1986, abandoned. This application Mar. 7, 1989, Ser. No. 320,121
Int. Cl.[5] C10G *47/20*
U.S. Cl. 208—111 9 Claims

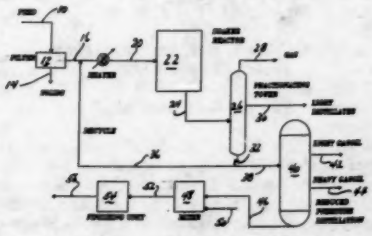
1. A process for dewaxing a hydrocarbon feedstock containing paraffins which comprises contacting the feedstock with a catalyst comprising a transition metal alumino-silicate IOZ-5 which has had the transition metal substantially extracted therefrom and having the x-ray diffraction pattern substantially that set forth in Table I and having a silica:alumina ratio of at least 5:1, and a metal hydrogenation component under dewaxing conditions.

4,961,837

PROCESS FOR THE PRODUCTION OF PETROLEUM TAR PITCH FOR USE AS A BINDER IN THE PRODUCTION OF ELECTRODES

Leon Velasco; Carlos Mota, and Domingo Rodriguez, all of Caracas, Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Filed Apr. 28, 1989, Ser. No. 345,203
Int. Cl.[5] C10G *9/16*
U.S. Cl. 208—41 25 Claims



1. A process for the production of high quality petroleum tar pitch comprising:

(a) providing a fresh hydrocarbon feedstock;

(b) pre-heating said feedstock in a furnace to a temperature of about between 380° to 480° C.;

(c) feeding said heated feedstock to a reactor and treating said feedstock in said reactor under controlled conditions so as to promote condensation and polymerization reactions;

(d) passing said treated feedstock to a fractionating tower wherein said feedstock is fractionated into (1) gases, (2) light distillates and (3) a bottom fraction stream;

(e) dividing said bottom fraction stream into a recycle stream and a cracked fraction stream;

(f) feeding said cracked fraction stream to a reduced pressure distillation tower wherein said light cracked fraction is further fractionated into (1) light gas oil, (2) heavy gas oil and (3) a high quality petroleum tar pitch; and

(g) recycling said recycled stream and admixing said recycled stream with said fresh feedstock.

4,961,838

TWO STEP PROCESS FOR THE OBTAINMENT OF WHITE OILS

Salvador A. Llovera, Avda. América, 50 - Madrid, Spain, assignor to Salvador A. Llovera, Madrid, Spain

Filed Jul. 10, 1989, Ser. No. 377,111
Int. Cl.[5] C10G *25/00*
U.S. Cl. 208—91 8 Claims

1. A two step process for obtaining white oils of technical and pharmaceutical degree from heavy alkylate oils often obtained as by-product from production of detergent linear alkylbenzenes, said process comprising;

(a) pre-treating said heavy alkylates with an activated fibrous hydrated magnesium silicate to reduce heavy aromatic components; and thereafter,

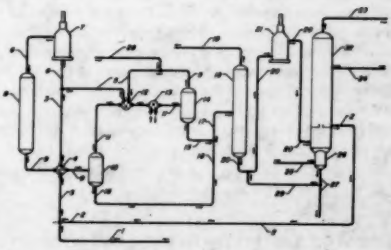
(b) hydrogenating the pretreated alkylates to provide white oils of a technical and pharmaceutical degree.

4,961,839

HIGH CONVERSION HYDROCRACKING PROCESS

Laurence O. Stine, Western Springs; Mark E. Reno, Villa Park; William H. Munro, Lincolnshire, and Simon J. Hamper, Lisle, all of Ill., assignors to UOP, Des Plaines, Ill.

Filed May 23, 1988, Ser. No. 197,239
Int. Cl.[5] C10G *65/12*
U.S. Cl. 208—102 11 Claims



1. A process for hydrocracking a heavy hydrocarbon feed stream having a 10 percent boiling point above about 316° C., said process comprising the steps of

passing said feedstream into a catalytic hydrocracking reaction zone in contact with hydrocracking catalyst comprising at least one metal selected from the group consisting of chromium, nickel, cobalt, platinum, palladium, tungsten and molybdenum, at a temperature above about 316° C. and a total pressure above 1480 kPa, said catalytic hydrocracking reaction zone operating at a feed stream conversion rate above 70 wt. percent with a hydrogen circulation rate in excess at 1777 m^3/m^3, to produce a reaction zone effluent stream,

subjecting said reaction zone effluent stream to cooling and a vapor-liquid separation to yield a recycle hydrogen stream and a liquid phase stream.

heating said liquid phase stream recovered from said vapor-

liquid separation to vaporize at least 90 volume percent of said liquid phase stream,

passing said heated and at least partially vaporized liquid phase stream to a fractionation zone wherein said stream is separated into at least a net bottoms stream having a flow rate less than 5 volume percent of the feed stream, a heavy distillate stream which is removed from said fractionation zone at a point above the feedpoint of said stream into the fractionation zone and which has a flow rate equal to 10 to 40 volume percent of the feed stream, and at least one light distillate stream which is removed as the distillate product stream,

removing all of said net bottoms stream from said process, and

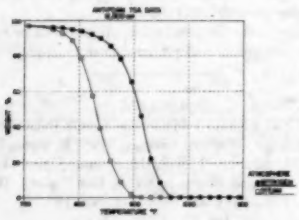
recycling substantially all of said heavy distillate stream to said catalytic hydrocracking zone.

4,961,840

ANTIFOAM PROCESS FOR DELAYED COKING

Shri K. Goyal, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Apr. 13, 1989, Ser. No. 337,252
Int. Cl.[5] C10G *9/14*
U.S. Cl. 208—131 **27 Claims**



1. In a delayed coking process wherein a heavy feed is passed into a coking drum at coking conditions including a temperature above about 800° F., to form solid coke and vapor products, wherein foaming of hydrocarbons in the coke drum is inhibited by addition of an effective amount of a polysiloxane to the hydrocarbons wherein an improvement comprises adding to the upper portion of the coke drum a mixture comprising polysiloxane and an inert gas wherein the mixture has a substantial absence of steam to substantially reduce thermal degradation of said polysiloxane and is heated up to at least about 400° F. prior to contacting any contents of the coking drum.

4,961,841

APPARATUS AND METHOD EMPLOYING MAGNETIC FLUIDS FOR SEPARATING PARTICLES

Uri T. Andres, London, United Kingdom; Alan L. Devernoe, and Michael S. Walker, both of Schenectady, N.Y., assignors to Mag-Sep Corporation, Guilderland, N.Y.

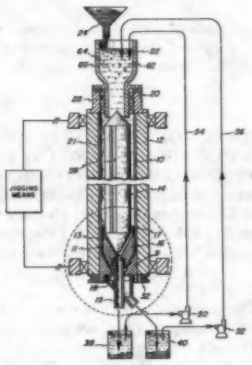
Continuation of Ser. No. 869,597, Jun. 2, 1986, Pat. No. 4,819,808, which is a continuation of Ser. No. 380,753, May 21, 1982, Pat. No. 4,594,149. This application Apr. 7, 1989, Ser. No. 335,129
Int. Cl.[5] B03B *5/32*; B03C *1/00*
U.S. Cl. 209—1 **21 Claims**

1. A method of separating a collection of particles in a gravitational field on the basis of differences in their magnetic properties and independent of their density properties, comprising the steps of:

(a) establishing an annular separation column of a ferromagnetic fluid medium having preselected magnetic properties, said column having a central axis and said axis being substantially aligned with the lines of force in the gravitational field;

(b) permitting the particles to be separated to fall through the medium under the influence of the gravitational field;

(c) establishing within the annular column substantially about its axis an elongated magnetic field having sufficiently high field gradient to separate at least two groups of particles having even small magnetic differences, and of such configuration as to produce substantially only radially directed axisymmetric forces on the ferromagnetic medium and the particles to be separated as the particles fall through the medium, the width of the separation annulus, the magnetic properties of the ferromagnetic



field medium and the type of magnetic field having been selected such that the amount of magnetization per unit volume of the medium divided by the magnetic field strength produces an effective magnetic susceptibility of the ferromagnetic medium of sufficient narrow range and between that of the two groups of particles to be separated so that the particles of one group are urged radially inwardly and those of another group are urged radially outwardly to form inner and outer fractions, respectively; and

(d) separately collecting the inner and outer fractions of particles.

4,961,842

SIPHON GRAVITY CLASSIFIER AND CLARIFIER

Douglas K. Schulz, P.O. Box 1264, Los Lunas, N. Mex. 87031, and Karl F. Meyers, P.O. Box 9, Tierra Amarilla, N. Mex. 87575

Filed Nov. 7, 1988, Ser. No. 267,943
Int. Cl.[5] B03B *5/00*
U.S. Cl. 209—155 **10 Claims**

1. An apparatus for the clarification of a liquid, said apparatus comrpising:

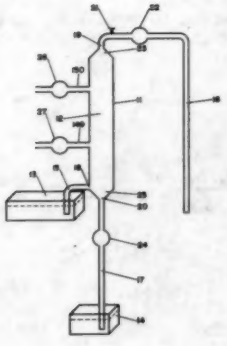
a first tall upright hollow cylindrical column, with vertical circular sides, said column being sealed at both ends with a single hole positioned in each end, into which a mixture of solids and liquids are drawn by a siphon created vacuum through a hole positioned in the vertical side of the hollow upright column near the bottom of the column, said column being tall enough to exceed the height to which the solids will rise, under a siphon created vacuum, but not so tall as to exceed the height to which a siphon created vacuum will draw the liquid vertically upward through the column, thereby effecting a separation of the liquid from the contained solids that enter the column as well as effecting the separation of solids of varying specific gravity that enter the column;

an intake tube, of significantly smaller diameter than the tall hollow cylindrical column, fitted on one end to the hole in the side of the column near the bottom of the column with

the opposite end of the tube emplaced to serve as an intake orifice;

a separate solid and liquid reservoir, located near the bottom of the tall upright hollow cylindrical column and connected thereto by the intake tube, which reservoir is provided for receiving the solid and liquid mixture, said solid and liquid mixture being maintained in the reservoir at a liquid level high enough above the intake orifice of the intake tube so as to prevent any air from entering the tall column through the intake orifice along with the solid and liquid mixture;

a tube for discharging the clarified liquid, said tube being of significantly smaller diameter than the diameter of the tall hollow cylindrical column and attached to the hole in the top end positioned in the center at the top of the column at one end of the tube for discharging a clarified liquid from the opposite end of the discharging tube, said opposite end being at a level significantly lower than the liquid level in the separate reservoir containing the intake tube thereby allowing the clarified liquid to move by siphon action from the solid and liquid receiving reservoir through the intake tube into the tall column whereby the siphon action further causes the clarified liquid to rise



vertically through the column and to exit the apparatus by way of the clarified liquid discharge tube while the thickened solids fall by gravity action to the bottom of the tall column;

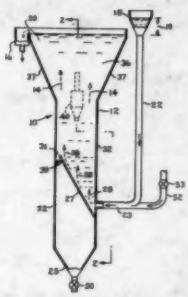
a tube for discharging the thickened solids, said tube being of significantly smaller diameter than the diameter of the tall hollow cylindrical column and attached to the hole in the bottom end positioned at the center of the bottom of the column at one end of the tube and discharging at the opposite end of the tube a liquid containing those solids that fall by gravity to the bottom of the column, which tube, by design, has a discharge end which extends to a level lower than the height to which the liquid in the thickened solids discharge tube is drawn back into the column by the vacuum created in the column by the siphon action of the apparatus; a second separate reservoir for receiving liquid and thickened solids, said second reservoir placed to receive the discharge end of the thickened solids discharge tube, said second reservoir being of sufficient volume to supply a volume of liquid greater than the volume of the thickened solids discharge tube so as to prevent any air from entering the tall column through the thickened solids discharge tube.

4,961,843

LEWIS ECONOSIZER FOR HYDRAULICALLY CLASSIFYING PARTICLES

Robert M. Lewis, 15 Valley View Dr., Candler, N.C. 28715

Filed Apr. 10, 1989, Ser. No. 335,815
Int. Cl.[5] B03B *5/66*
U.S. Cl. 209—210 **8 Claims**



1. A particle separator for treating a liquid containing relatively coarse particles and relatively fine particles; said separator comprising a vertically extending liquid-containment column; said column comprising first and second vertically-extending side walls facing each other in spaced opposed relationship; an inclined baffle plate extending angularly from said first side wall toward said second side wall; said baffle plate having a lower edge connected to said first side wall and an upper edge spaced a slight distance from said second side wall to provide a gap therebetween, for separating relatively coarse particles out of the liquid; means in said first side wall for admitting the particle-containing liquid into the column; said admitting means being located above the lower edge of said baffle, whereby the baffle causes the particle-containing liquid to flow upwardly through the column; a hopper connected to the lower end of the column for receiving relatively coarse particles that have passed downwardly through said gap; and a liquid header (39) located below said gap for directing jets of liquid upwardly through the gap so as to prevent relatively fine particles in the liquid from moving down through the gap.

4,961,844

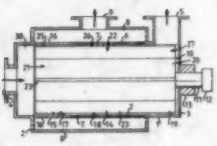
APPARATUS FOR SEPARATING A SUSPENSION OF FIBROUS CELLULOSE PULP

Rolf Ekholm; Rune Hillström, and Daniel Palsson, all of Karlstad, Sweden, assignors to Kamyr AB, Karlstad, Sweden

Filed Mar. 28, 1989, Ser. No. 332,020
Claims priority, application Sweden, May 5, 1988, 8801703
Int. Cl.[5] B07B *1/20*
U.S. Cl. 209—273 **29 Claims**

1. An apparatus for separating a suspension of fibrous cellulose pulp into at least two portions comprising a closed housing having inlet and outlets, and a rotor means in the form of an integral elongate rotor having first and second parts driven by a common shaft, and having vanes extending over both said parts, said first rotor part surrounded by a screening means, the first rotor part and the screening means in their axial extension forming a screening zone and being arranged to cooperate with each other during rotation of the first rotor part for screening the suspension in a fluidized state, said second rotor part located immediately adjacent to the first rotor part; a rigid, water-impervious wall member surrounding said second rotor part, said wall member having a plurality of recesses on an inner surface thereof, the second rotor part and the wall member in their axial extension forming a pre-treating zone located immediately upstream of the screening zone and cooperating with each other during rotation of the second rotor part,

wherein the length of the pre-treating zone constitutes about 20–100% of the length of the screening zone, and said vanes of said second rotor part, during rotation of the rotor part, run along the inner surface of the wall member, without coming into contact therewith; means for effecting rotation of said



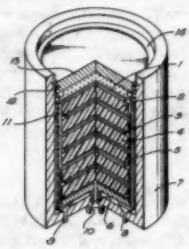
rotor at a speed sufficient to fluidize the pulp in said pre-treating zone for subsequent screening in said screening zone located immediately thereafter, and wherein the screening means and the wall member are in the form of a cylinder unit manufactured from one and the same piece of sheet metal.

4,961,845

APPARATUS AND METHOD FOR FILTERING PARTICULATE MATTER FROM DIELECTRIC FLUIDS

John Dawson, Clovis, and Eugene S. Carlson, Fresno, both of Calif., assignors to Diajet, Inc., Fresno, Calif.

Filed Dec. 23, 1988, Ser. No. 289,205
Int. Cl.[5] B01D *35/06*
U.S. Cl. 210—85 **41 Claims**



1. A filter for removing paricles from fluids in a fluid system comprising:

a housing having an internal chamber and providing an inlet portion and an outlet portion, the inlet portion being connected in fluid-flow relation to a portion of the fluid flow system for delivery of fluids from the fluid system into the internal chamber, and the outlet/portion being connected in fluid flow relation to a portion of the fluid system for discharge of the fluid from the internal chamber to the fluid system;

a first and second electrode assembly, each electrode assembly comprising a convoluted unitary member having a plurality of electrically conductive electrodes spaced axially of each other within the internal chamber and having electrically conductive tab means for interconnecting the electrodes, each electrode having a substantially flat body providing a multiplicity of bores of predetermined dimensions therethrough, said electrodes being disposed substantially transverse to the path of fluid flow, and electrodes from said first electrode assembly being disposed in an alternating relation with electrodes of said second electrode assembly;

porous filter media disposed between adjacent electrodes, said filter media having a multiplicity of passages therethrough for flow of fluids through the passages and capturing of particles therein;

a positive and negative electrical source; and

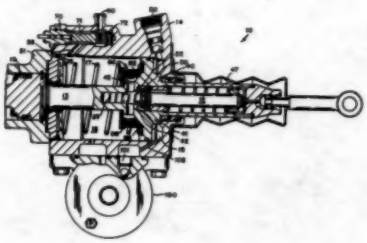
a positive and a negative electrode connector disposed through said housing, said positive electrode connector electrically connected to said first electrode assembly and said positive electrical source and said negative electrode connector electrically connected to said second electrode assembly and said negative electrical source.

4,961,846

COLLAPSIBLE FILTER FOR A FLUID POWER APPARATUS

Larry E. Isakson, Mishawaka, Ind., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Jun. 21, 1989, Ser. No. 369,387
Int. Cl.[5] B01D *27/10*; F15B *21/04*
U.S. Cl. 210—131 **11 Claims**

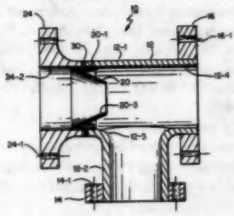


1. An apparatus in combination with a collapsible filter, the apparatus comprising a fluid power apparatus having a housing, an input rod, a first chamber and a work chamber divided by a power piston, a spring biasing said power piston, a fluid power inlet communicating with said work chamber, a fluid power outlet communicating with said first chamber, passage means through said power piston, valve means connected to said input rod and controlling fluid flow through said passage means, the collapsible filter comprising an end cap and an end member connected together by collapsible filter means, the end cap including a part, at which the filter means is connected and the part extending inwardly to a central opening, the central opening including a sealing mechanism, the end member comprising a part connected with said filter means, and a flange, the collapsible filter disposed about a piston rod of said power piston so that said sealing mechanism engages sealingly the piston rod which extends through the central opening, the flange seating at the power piston such that the spring cooperates with said flange, displacement of the input rod effecting operatively a displacement of the power piston such that a full stroke displacement of the power piston includes the end cap engaging a portion of said first chamber and the collapsible filter means collapsing in order to permit the full stroke displacement.

4,961,847
SUCTION STRAINER

Yehia M. Amr, Manlius, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 2, 1989, Ser. No. 306,016
The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.
Int. Cl.[5] B01D *35/02*
U.S. Cl. 210—137 7 Claims

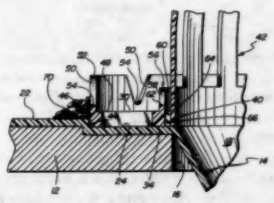


1. A suction strainer assembly comprising:
housing means including a tee having a crossarm with a bore therein and an upright branch with a bore therein intersecting said bore of said crossarm to define an intersection;
said crossarm bore having a first end defining an inlet and a second end which is closed;
said upright branch defines an outlet;
a single strainer means;
seat means including an inner member which extends into said crossarm bore near said first end and inside said strainer means and tapers inwardly into said crossarm bore to define a flow path whereby all fluid entering said inlet is directed through said flow path in said seat means;
said strainer means including a single mesh portion having a generally circular cross section and coacting with said seat means and said crossarm bore to seat on said seat means within said crossarm bore and to position said mesh portion in spaced relationship with said bore of said crossarm so as to define an annular space therewith and in spaced relationship with said intersection whereby fluid entering said inlet serially passes through said flow path in said seat means directly into said strainer means, radially through said mesh portion over its entire circumference into said annular space and thence into said upright branch bore.

4,961,848
DRAIN GRATE WITH PRIMARY AND SECONDARY WEIRS

Duane D. Logsdon, Fullerton, Calif., assignor to Logsdon Foundation, Stanton, Calif.

Filed May 17, 1989, Ser. No. 352,957
Int. Cl.[5] E03F *5/14*
U.S. Cl. 210—165 5 Claims



1. A roof drain cover having a centrally located, upstanding, perforate, hollow grate and a generally circular peripheral mounting flange attached to the periphery of the bottom of said grate so as to extend outwardly therefrom in which the improvement comprises:
said grate having a generally circular peripheral end meeting perpendicularly with said flange and joining integrally therewith;
a primary upstanding circular rim serving as a weir attached to the periphery of said mounting flange so as to extend upwardly from said flange a distance less than the height of said grate, said primary rim having a plurality of first notches located so as to extend from the upper end of said rim toward the flange, said first notches in said primary rim being equally spaced from one another and terminating above said flange,
a secondary upstanding circular rim also serving as a weir formed as part of said mounting flange adjacent to and outside the juncture of said grate and said mounting flange so as to be spaced from said grate to define a channel between said grate and said secondary rim and so as to extend upwardly from said mounting flange a distance less than the height of said grate, said secondary rim having a plurality of second notches located so as to extend from the upper end of said rim toward the mounting flange, said second notches in said secondary rim being equally spaced from one another and terminating above said mounting flange, and
particle collection means located in said mounting flange between said primary and secondary rims;
said second notches being of a size smaller than said first notches, the respective sizes of said first and second notches and respective heights of said primary and secondary rims being selected such that inorganic material is filtered by size and said primary and secondary rims and such that organic matter lighter than said inorganic matter floats up and over heavier inorganic material;
said peripheral mounting flange including weep holes leading through said mounting flange from said channel.

4,961,849
MAGNETICALLY ATTACHED FILTER

Harold L. Hull, 401 Canyon Way, SP43, Spanks, Nev. 89434, and Allen Klingamen, 1242 Glendale, Spanks, Nev. 89431

Filed Dec. 19, 1988, Ser. No. 286,340
Int. Cl.[5] B01D *39/08, 29/01*
U.S. Cl. 210—169 4 Claims

1. A magnetically attached filter comprising sun glass filter means, frame means attached to said filter means, said frame means consisting essentially of magnetic impregnated vinyl and means to attach said frame to said filter.

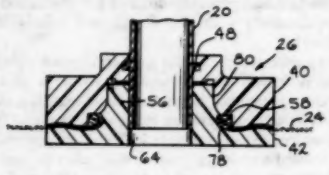
4,961,850
IN-TANK FUEL FILTER

John F. Combest, Findlay, Ohio, assignor to Kuss Corporation, Findlay, Ohio

Filed May 9, 1989, Ser. No. 349,524
Int. Cl.[5] B01D *35/02*
U.S. Cl. 210—232 15 Claims

1. A fuel filter comprising, in combination,
a fabric body defining a fuel withdrawing aperture,
a fuel line fitting for disposition in said fuel withdrawing

aperture, said fitting including a first segment defining a through aperture, a second segment including a projection disposed within said through aperture and forming an



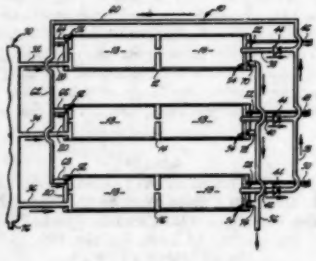
interface with said first segment and a bead of material constituted at least partially of material from said second segment disposed adjacent said interface and engaging said fabric adjacent said fuel withdrawing aperture.

4,961,851

SELF-CLEANING REVERSE OSMOSIS LIQUID TREATMENT SYSTEM, METHOD AND DUAL CONFIGURATION CHECK VALVE THEREFOR

Fernando G. R. Barbachano, 495 Montejo Avenue, Meridan, Yucatan, Mexico, and Walter A. Sudymont, 19945 SW. 264th St., Miami, Fla. 33031

Filed Apr. 20, 1990, Ser. No. 511,719
Int. Cl.[5] B01D *61/08*
U.S. Cl. 210—321.65 **4 Claims**



1. A self-cleaning reverse osmosis liquid treatment system comprising:

at least two reverse osmosis membrane vessels each housing at least one reverse osmosis membrane therein, one of said vessels being a processing vessel and the other said vessel being a flushing or cleansing vessel;

each said vessel including an inlet head having an intake liquid inlet and a product liquid inlet each in fluid communication with said membrane within the corresponding said vessel and an outlet head having a waste liquid outlet, a product liquid outlet, and a storage tank outlet;

a intake liquid inlet valve which selectively delivers intake liquid under higher pressure to said intake liquid inlet of said processing vessel;

a product liquid outlet manifold connected to each said product liquid outlet for collecting product liquid discharging from said processing vessel;

a product liquid inlet manifold connected at one end to said product liquid outlet manifold and connected at the other end to each said product liquid inlet;

a normally closed check valve positioned in each said product liquid inlet and a normally open check valve positioned in each said storage tank outlet;

means for enabling each said normally closed and normally opened check valve in each said vessel cooperatively to act to allow product liquid to enter each said cleansing vessel to flush through each said membrane therein and to discharge through each said storage tank outlet into a storage tank manifold when higher pressure intake liquid flow into said intake liquid inlet is shut off by said intake liquid inlet valve.

4,961,852

POLYALDEHYDE ACTIVATED MEMBRANES

Kanyawasam P. W. Pemawansa, Ann Arbor; Mark Heisler, Saline, and Menahem Kraus, Ann Arbor, all of Mich., assignors to Gelman Sciences, Inc., Ann Arbor, Mich.

Division of Ser. No. 96,730, Sep. 14, 1987, Pat. No. 4,824,870.
This application Mar. 9, 1989, Ser. No. 321,282
Int. Cl.[5] B01D *29/00, 29/46, 39/00*
U.S. Cl. 210—490 **7 Claims**

1. An affinity membrane comprising:

a microporous polymeric membrane matrix with available surface areas including an internal surface area comprising internal pore surfaces and internal interstices, and an external surface area; and

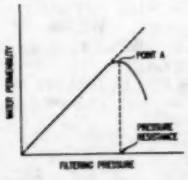
polyaldehyde having physically bound aldehyde functional groups which are thus bound without significant chemical reaction to substantially all said available surface areas, said polyaldehyde further having unbound aldehyde groups that are free to react with an have an affinity for aldehyde reactive materials, said unbound polyaldehyde groups being in an amount such that the affinity of the membrane for protein is characterized by enhanced specifity and total binding capacity.

4,961,853

POROUS MEMBRANES AND PRODUCTION PROCESSES THEREOF

Hajime Itoh, Hiroshima; Kouzi Ohbori, Aichi; Kazutami Mitani, Hiroshima; Hiroshi Takahashi, Hiroshima; Kouji Takehashi, Hiroshima, and Kunihiro Aoki, Hiroshima, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

PCT No. PCT/JP88/01064, § 371 Date Jun. 23, 1989, § 102(e) Date Jun. 23, 1989, PCT Pub. No. WO89/04198, PCT Pub. Date May 18, 1989
PCT Filed Oct. 20, 1988, Ser. No. 378,571
Claims priority, application Japan, Nov. 4, 1987, 62-278733; Nov. 4, 1987, 62-2787341
Int. Cl.[5] B01D *67/00, 69/00*
U.S. Cl. 210—500.34 **9 Claims**

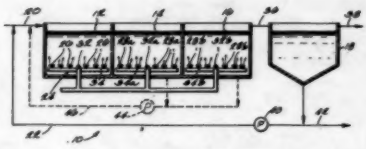


1. A heat-resisting porous membrane comprising a porous polyethylene or polypropylene membrane having a crosslinked polymer held on at least a part of the surfaces thereof, the crosslinked polymer being composed principally of (a) a polymerizable monomer A containing one acid anhydride group or two esterified carboxyl groups and having reactivity ratios R_1 and R_2 of not greater than 0.30 for copolymerization with styrene, (b) divinylbenzene and optionally (c) at least one of styrene and α-methylstyrene in proportions and under conditions to provide heat resistant properties sufficient to enable said member to effectively withstand wet steam sterilization.

4,961,854
ACTIVATED SLUDGE WASTEWATER TREATMENT PROCESS

John W. Wittmann, New Berlin; Donald J. Thiel, Waukesha, and George W. Smith, Mukwonago, all of Wis., assignors to Envirex Inc., Waukesha, Wis.

Filed Jun. 30, 1988, Ser. No. 213,321
Int. Cl.[5] C02F 3/20
U.S. Cl. 210—621 14 Claims



1. In a process for treating BOD-containing wastewater by contacting a wastewater influent with activated sludge in a reaction zone to form a mixed liquor, separating a sludge from the mixed liquor and recycling the separated sludge to the reaction zone as activated sludge, the improvement comprising

introducing the wastewater and recycled activated sludge into a first aeration zone and homogeneously mixing the wastewater and recycled activated sludge therein primarily by injecting an oxygen-containing gas under conditions which produce a complete mix reaction in said first aeration zone and sufficient oxygen is provided by said oxygen-containing gas to meet, but not substantially exceed, the biological oxygen demand of the resulting mixed liquor such that the overall dissolved oxygen content thereof is substantially 0 and does not exceed about 0.5 mg/l, said oxygen-containing gas being introduced into the lower portion of said first aeration zone by a a plurality of fine bubble diffusers located in the bottom of said first reaction zone and having a flexible member made from an expandable, elastomeric material and including perforations having openings for producing bubbles which have a diameter of about 1 to about 4 mm, when said oxygen-containing gas is introduced under pressure into said diffusers, and are substantially uniformly dispersed throughout said first aeration zone;

transferring the mixed liquor from said first aeration zone to a subsequent aeration zone wherein the mixed liquor is contacted with an oxygen-containing gas under conditions which produce a complete mix reaction in said subsequent aeration zone and sufficient oxygen is provided to produce an overall dissolved oxygen content of at least 0.5 mg/l;

transferring the oxidized mixed liquor from said subsequent aeration zone to a settling zone wherein a supernatant liquid is separated from settled sludge; and

recycling at least a portion of the settled sludge to said first aeration zone as recycled activated sludge.

4,961,855
DEHYDRATION OF ORGANIC OXYGENATES

John Reale, Jr., and Craig R. Bartels, both of Wappingers Falls, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 97,766, Sep. 17, 1987, Pat. No. 4,802,988. This application Dec. 5, 1988, Ser. No. 279,398
The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.
Int. Cl.[5] B01D 13/00
U.S. Cl. 210—640 18 Claims

1. The method of concentrating an aqueous charge including an organic oxygenate which comprises

maintaining a non-porous separating layer of cast polyvinyl alcohol which has been cross-linked with an aliphatic polyaldehyde containing at least three carbon atoms including those in said aldehyde groups;

maintaining a pressure drop across said non-porous separating layer of polyvinyl alcohol;

passing an aqueous charge including an organic non-porous separating layer of polyvinyl alcohol whereby at least a portion of said water in said charge and a lesser portion of organic oxygenate in said charge pass by pervaporation through said non-porous separating layer of polyvinyl alcohol as a lean mixture containing more water and less organic oxygenate than are present in said charge and said charge is converted to rich liquid containing less water and more organic oxygenate than are present in said charge;

recovering from the low pressure side of said non-porous separating layer of polyvinyl alcohol, said lean mixture containing more water and less organic oxygenate than are present in said charge, said lean mixture being recovered in vapor phase at a pressure below the vapor pressure thereof; and

recovering from the high pressure side of said non-porous separating layer said rich liquid containing a lower water content and a higher organic oxygenate content than are present in said charge.

4,961,856
SOLVENT EXTRACTION PROCESS

Raymond F. Dalton, Cheadle Hulme, and Arthur Burgess, Oldham, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Feb. 27, 1989, Ser. No. 316,064
Claims priority, application United Kingdom, Mar. 9, 1988, 8805565; Dec. 14, 1988, 8829121
Int. Cl.[5] C02F 1/42; G21F 9/04
U.S. Cl. 210—681 17 Claims

1. A solvent extraction process by extracting palladium values from aqueous solutions of palladium salts containing halide or pseudo halide anion and at least one additional metal which comprises the step of (1) contacting the aqueous solution containing palladium salts with a solution of an extractant in a water-immiscible organic solvent for as little as thirty minutes; (2) separating the aqueous solution from the solution of the extractant in the water-immiscible solvent into which palladium has been extracted; and (3) contacting the resultant organic phase with an aqueous strip solution sufficient that the palladium transfers into the aqueous strip solution wherein in step (1) the aqueous solution of palladium salts containing halide or pseudo halide anion is contacted with a solution in a water-immiscible organic solvent of an extractant which is a substituted heterocyclic compound containing a single heterocyclic ring containing 1, 2 or 3 nitrogen ring atoms and one or more groups —COX which are linked directly to the heterocyclic ring or an linked to the heterocyclic ring through a group A wherein

A is an optionally substituted methylene linking group, an optionally substituted vinylene linking group or an optionally substituted phenylene linking group;

X is a group $—OR^1$ or $—NR^2R^3$;

R^1 is a hydrocarbyl group or substituted hydrocarbyl group containing from 5 to 36 carbon atoms; and

R^2 and R^3 which may be the same or different, are hydrogen or a hydrocarbyl group or a substituted hydrocarbyl group, and in each group $—NR^2R^3$, R^2 and R^3 together contain from 5 to 36 carbon atoms.

4,961,857

THROTTLING DEVICE AND METHOD FOR FEEDING GAS DISSOLVED IN LIQUID UNDER HIGH PRESSURE INTO LIQUID UNDER LOW PRESSURE

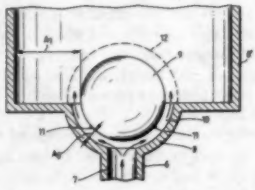
Simon P. P. Ottengraf, Koninglaan, and Johannes G. Wijers, Brouwerstraat, both of Netherlands, assignors to Nijhuis Water B. V., Winterswijk, Netherlands

Continuation-in-part of Ser. No. 96,134, Sep. 11, 1987, abandoned. This application Oct. 19, 1987, Ser. No. 110,185

Claims priority, application Netherlands, Sep. 11, 1986, 8602297

Int. Cl.[5] C02F 1/24

U.S. Cl. 210—703 20 Claims



1. Throttling device for feeding a liquid under high pressure having gas dissolved therein into a liquid under lower pressure, comprising:

a means defining a high-pressure chamber (P_1);

a means defining a lower-pressure second chamber (P_0);

a means for feeding liquid under high pressure having gas dissolved therein into said high-pressure chamber;

a means defining a flow orifice between said high-pressure chamber and said lower-pressure chamber;

a means defining a pressure equilibrium zone including a movable body and a stationary wall of the lower-pressure chamber, said movable body being located downstream of said flow orifice, said movable body being operable to adjust its position responsive to differential pressure forces of the liquid flowing from the high-pressure chamber (P_1) to the lower-pressure chamber (P_0), the movable body and the stationary wall defining the pressure equilibrium zone such that the flow of liquid in the pressure equilibrium zone must change direction after exiting said flow orifice thereby forming a liquid pressure (P_c) in the pressure equilibrium zone, such that a net force acting on the surface of the movable body, including forces determined by the low pressure (P_0) in the lower-pressure chamber and by the liquid pressure (P_c) formed by the flow in the pressure equilibrium zone, are essentially in equilibrium with the thrust of the liquid passing through the orifice;

a passage slit surrounding the movable body defining by said movable body in cooperation with a portion of the stationary wall of the lower-pressure chamber, said slit having a width (A_0), through which slit the liquid undergoing pressure release flows, the slit between the movable body and the stationary wall being situated downstream of the flow orifice, said slit defining a debouchment zone at the point of the largest diameter of the movable body into the lower-pressure chamber (P_0), such that debouchment occurs as the liquid exits the slit, the liquid being permitted to assume the pressure of the lower-pressure chamber (P_0)after exiting the slit; and,

a flow section (A_1) being defined in said lower-pressure chamber (P_0) at the point of debouchment of the slit, said flow section (A_1) being larger than the slit width (A_0), said flow section (A_1) being measured at the point of debouchment between a wall of the lower-pressure chamber (P_0) and the point of said largest diameter of the movable body;

the responsive adjustments of the position of the movable body being operative to widen or narrow the slit width (A_0), said widening or narrowing, in cooperation with the relative size of the flow section (A_1), being operative to cause a sufficient pressure release of the liquid under high pressure with gas dissolved therein to produce small bubbles of gas in the debouchment zone.

4,961,858

PROCESS FOR THE DEMULSIFICATION OF OIL/WATER EMULSIONS USING ORGANIC DEMULSIFIERS AND THE USE OF SAID PROCESS

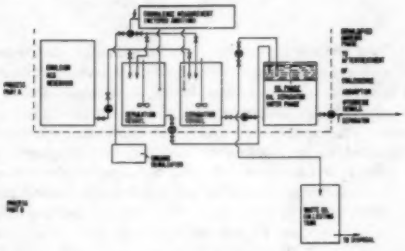
Brigitte Spei, Duesseldorf, and Volker Wehle, Haan, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 11, 1989, Ser. No. 377,972

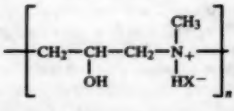
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1988, 3823455

Int. Cl.[5] B01D 17/05

U.S. Cl. 210—708 6 Claims



1. A process for demulsifying an oil-in-water emulsion comprising adding an organic polyamine demulsifier to said emulsion in a separation vessel by means of a metering device for the controlled addition of said demulsifier, and conducting the demulsifying process at a temperature of from about 60° C. to about 90° C. while mixing the emulsion and demulsifier to provide a demulsified product having a water content of less than about 10% by weight based on the weight of said emulsion, said polyamine demulsifier having the formula



and an average molecular weight of about 0.1×10^6 wherein the addition of demulsifier is controlled by a turbidimetric probe in said separation vessel.

4,961,859

METHOD OF TREATING AN AQUEOUS PROCESSING WASTE SOLUTION OF A NON-SILVER HALIDE LIGHT-SENSITIVE MATERIAL AND A DEVICE THEREFOR

Masafumi Uehara; Akira Nogami; Kazuhiro Shimura; Keiichi Yumiki, and Akio Iwaki, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jan. 31, 1989, Ser. No. 304,805

Claims priority, application Japan, Aug. 31, 1988, 63-217404; Aug. 31, 1988, 63-217405

Int. Cl.[5] B01D 1/00

U.S. Cl. 210—725 27 Claims

1. A method of dividing an aqueous processing waste solution of a non-silver halide light-sensitive material, into a solid and water, said method comprising:

(a) introducing said solution into an evaporator,

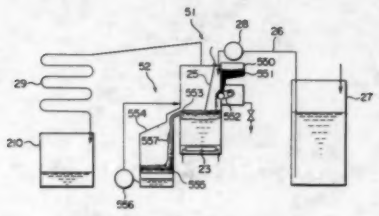
(b) concentrating said solution by heating,

(c) removing sludge produced in said evaporator from both

the upper surface and bottom of the solution during concentration of said solution by heating,

(d) separating the sludge into said solid and water, and

(e) cooling and condensing evaporated gas to water,



wherein said sludge produced in the evaporator is removed from the upper surface of the solution by being made to adhere to at least one floating ball.

4,961,860

METHOD OF WATER TREATMENT

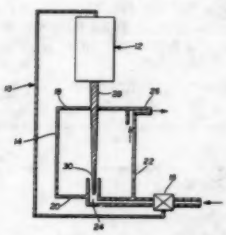
Saad A. Masri, 36 Wildwood Road West, Lethbridge, Alberta, Canada (T6K 6C6)

Filed Mar. 20, 1989, Ser. No. 325,431

Claims priority, application Canada, Nov. 23, 1988, 583869

Int. Cl.[5] C02F *1/36*

U.S. Cl. 210—748 **7 Claims**



1. A method of treating water to kill harmful microorganisms contained therein, comprising the steps of:

a. firstly, diverting the water to be treated into a holding tank;

b. secondly, subjecting the water in the holding tank to ultrasonic vibrations in a range between 15 and 150 kilohertz for a period in excess of 12 seconds by a plurality of ultrasonic probes mounted on one or more arms which rotate in the holding tank thereby achieving cavitation and killing the harmful microorganisms.

4,961,861

PROCESS FOR WORKING UP HYDROLYSIS RESIDUES FROM THE SYNTHESIS OF ORGANOCHLOROSILANES

Bruno Degen, Much, and Kurt Feldner, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

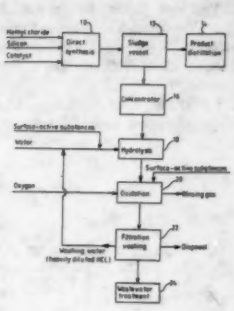
Filed Aug. 16, 1989, Ser. No. 394,606

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1988, 3829581

Int. Cl.[5] B01D *21/00*

U.S. Cl. 210—717 **5 Claims**

1. A process for hydrolyzing and optionally oxidizing high-boiling, solids-containing residues obtained in the synthesis of organochlorosilanes which are hydrolyzed and then optionally oxidized with oxygen-containing gases, comprising adding during hydrolysis and/or oxidation a surface-active substance which hydrophilicizes the surface of the solids, wherein the



surface-active substance is an inorganic deposit which is produced in solution and precipitates onto the surface of the solids.

4,961,862

AMENDMENT ADDITION SYSTEM AND METHOD FOR TWIN BELT PRESS FILTER

Kenneth F. Janecek, Salt Lake City, Utah, assignor to Baker Hughes, Houston, Tex.

Filed Mar. 22, 1988, Ser. No. 171,712

Int. Cl.[5] B01D *33/048*

U.S. Cl. 210—778 **20 Claims**

13. A method of dewatering a slurry in a filter having two porous belts, a gravity drain zone, and a series of belt press rollers downstream of said drain zone, comprising the steps of:

(a) passing a first of said belts over said drain zone from a first end of said drain zone to a second end thereof;

(b) feeding said slurry to said first of said belts at a position adjacent said drain zone first end, said belt carrying said slurry to said drain zone to initially gravity drain the slurry and form a partially dewatered cake on said first belt;

(c) convergingly bringing a second of said belts into parallelism with said first belt;

(d) feeding said partially dewatered cake into a nip formed between said converging belts;

(e) feeding an amendment consisting essentially of a solid absorbent particulate material onto and mixing said particulate material into said partially dewatered cake as the partially dewatered cake is fed into said nip for further improving the dewaterability of said partially dewatered cake; and

(f) pressing the resultant mixture of amendment and partially dewatered cake between said converged parallel belts to further dewater said partially dewatered cake and slurry.

4,961,863

PROCESS FOR THE SEPARATION OF SOLIDS FROM A MIXTURE OF SOLIDS AND FLUID

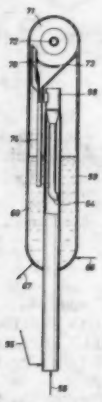
Hendrikus E. A. Van Den Akker, Amsterdam; Rudi Everts, The Hague; Jouke J. Woudstra, The Hague; Peter H. Barnes, The Hague; Cornelis M. Verheul, The Hague, and Hendrik A. Dirkse, The Hague, all of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 10, 1989, Ser. No. 321,617

Claims priority, application United Kingdom, Mar. 10, 1988, 8805755

Int. Cl.[5] B01D *45/12*

U.S. Cl. 210—788 1 Claim



1. A process for the separation of solids from a mixture of solids and fluid in a reactor comprising passing the mixture upwardly via a supply opening which branches into a plurality of separation chambers in the upper portion of the reactor, each chamber being arranged around a central longitudinal axes and having a curved inner wall such that the intersection of the inner wall and a plane perpendicular to the central longitudinal axes is a concave line, wherein all central longitudinal axes are in one plane, withdrawing fluid from fluid outlet openings, and withdrawing solids downwardly from solids outlet openings situated on the same side of the plane of the central longitudinal axes as the supply opening, and passing the withdrawn fluid upwardly and tangentially into a substantially spherical separation zone located above the separation chambers in the reactor, wherein the withdrawn fluid is subjected to a rotating movement in a substantially vertical plane, removing solids, entrained by the withdrawn fluid, through an opening in the lower section of the separation zone and removing purified fluid via an outlet which debouches substantially horizontally into a central part of the spherical separation zone.

4,961,864

SEPARATING DEVICE

Richard Bruke, Bunkeflostrand, Sweden, assignor to Spirac Engineering AB, Malmo, Sweden

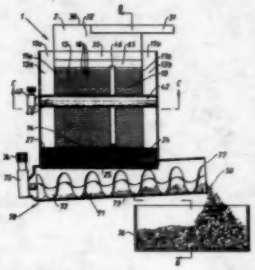
Filed Feb. 27, 1989, Ser. No. 316,288

Claims priority, application Sweden, Feb. 29, 1988, 8800701

Int. Cl.[5] B01D *29/64*

U.S. Cl. 210—791 21 Claims

1. A method of separating solids from a liquid comprising depositing a liquid containing solids onto a grid which is inclined with respect to the horizontal so that the liquid containing the solids flows downwardly along the grid, passing liquid through the grid and retaining solids thereon which travel downwardly on the grid to a lower collecting means, displacing a cleaning means transversely across said grid with reciprocal movement to separate the retained solids from the grid, discharging some of the solids which have been separated from the grid at the opposite lateral edge regions of the grid, receiving the solids discharged at the lateral edge regions of the grid



on transport surfaces adjacent to said grid, forming said transport surface of low friction material to expedite travel of the discharged solids thereon and conveying the solids on the low friction transport surfaces towards the lower collecting means.

4,961,865

COMBUSTION INHIBITING METHODS AND COMPOSITIONS

Edmond R. J. Pennartz, N. Vancouver, B.C., Canada, assignor to United American, Inc., Custer, Wash.

Continuation-in-part of Ser. No. 292,417, Dec. 30, 1988. This application Mar. 6, 1989, Ser. No. 319,750

Int. Cl.[5] A62D *1/00*; A62C *1/00, 3/00*

U.S. Cl. 252—7 7 Claims

1. A fire extinguishing composition formulated as follows:

Constituent	Percent by Weight
Sodium Chloride	2 to 28
Magnesium Chloride	7 to 16
Sodium Sulfate Decahydrate	1 to 10
Sodium Borate	3 to 20
Calcium Chloride	0 to 16
Magnesium Sulfate	0 to 8
Magnesium Bromide	0 to 10
Potassium Chloride	0 to 7
Water	Balance.

4,961,866

COMPOSITION FOR SOFTENING FABRICS: CLAY SOFTENING AGENT AND NONIONIC SURFACTANT IN CLOUDY PHASE

Ian R. Kenyon, Wirral, England, and Bryan C. Smith, Rotterdam, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Apr. 8, 1988, Ser. No. 179,091

Claims priority, application United Kingdom, Apr. 15, 1987, 8709057

Int. Cl.[5] C11D *1/66, 3/12*

U.S. Cl. 252—8.6 8 Claims

1. A particulate composition for softening fabrics from a wash liquor, said composition consisting esentially of a fabric softening clay material which is a three-layer swellable smectite clay of the montmorillonite type in intimate contact with a nonionic surfactant system which exists as a cloudy phase at 1% concentration in water somewhere within the temperature range of 0° C. to 80° C., said nonionic surfactant system having an HLB of less than about 9.5 and the weight ratio of said clay

material to said nonionic surfactant system being from about 2:3 to about 20:1, and a builder other than clay.

4,961,867

PROCESS FOR PREVENTING CORROSION OF METALS BY CONTACTING THEM WITH COMPOSITIONS PREPARED FROM AMINO SUBSTITUTED PYRAZINES AND CARBOXYLIC ACIDS CARBOXYLIC ACID ANHYDRIDES, CARBOXYLIC ACID, ESTERS OR CARBOXYLIC ACID HALIDES

Duane S. Treybig, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

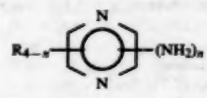
Division of Ser. No. 176,901, Apr. 4, 1988, Pat. No. 4,861,884, which is a continuation-in-part of Ser. No. 787,586, Oct. 15, 1985, abandoned. This application Feb. 14, 1989, Ser. No. 310,798

Int. Cl.[5] C23F *11/14*

U.S. Cl. 252—8.555 **15 Claims**

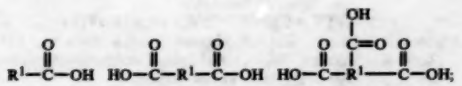
1. A process for preventing the corrosion of a metal composition in contact with a down hole well fluid which process comprises contacting the surface of said metal composition with an effective amount of, as a corrosion inhibitor, a composition resulting from reacting

(A) at least one pyrazine compound represented by the formula



wherein each R is independently hydrogen, a hydrocarbyl group or a hydrocarbyloxy group, having from 1 to 20 carbon atoms: or a halogen atom, group and n has a value from 1 to 4;

(B) at least one carboxylic acid represented by the formulas



and wherein R^1 is an aliphatic or a cycloaliphatic group or a sulfur, halogen or hydroxyl substituted aliphatic or cycloaliphatic group having from 1 to 72 carbon atoms, and

(C) optionally in the presence of sodium hydride; and

wherein components (A) and (B) are present in quantities which provide a ratio of —CO— groups to $—NH_2$ or —NH— groups of from about 0.25:1 to about 1.2:1 and component (C) is present in quantities which provide a ratio of sodium hydride to $—NH_2$ or —NH— groups of from about 0:1 to about 1.5:1.

4,961,868

GREASE COMPOSITION

John P. Doner, Sewell; Andrew G. Horodysky, Cherry Hill, and John A. Keller, Jr., Pitman, all of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 210,136, Jun. 13, 1988, abandoned, which is a continuation of Ser. No. 81,590, Aug. 3, 1987, abandoned, which is a continuation of Ser. No. 851,637, Apr. 14, 1986, abandoned, and a continuation-in-part of Ser. No. 774,873, Sep. 12, 1985, abandoned, which is a continuation of Ser. No. 641,077, Aug. 15, 1984, abandoned, which is a continuation-in-part of Ser. No. 587,328, Mar. 7, 1984, abandoned, and a continuation-in-part of Ser. No. 641,078, Aug. 15, 1984, abandoned, which is a continuation-in-part of Ser. No. 577,454, Feb. 6, 1984, abandoned, and a continuation-in-part of Ser. No. 831,073, Feb. 18, 1986, abandoned, which is a continuation of Ser. No. 643,344, Aug. 22, 1984, abandoned, and a continuation-in-part of Ser. No. 643,346, Aug. 22, 1984, Pat. No. 4,600,517, and a continuation-in-part of Ser. No. 792,168, Oct. 25, 1985, abandoned, which is a continuation of Ser. No. 643,347, Aug. 22, 1984, abandoned, and a continuation-in-part of Ser. No. 769,827, Aug. 27, 1985, abandoned, and a continuation-in-part of Ser. No. 769,826, Aug. 27, 1985, Pat. No. 4,743,386, which is a continuation-in-part of Ser. No. 682,579, Dec. 17, 1984, abandoned, which is a continuation of Ser. No. 445,883, Dec. 1, 1982, abandoned, said Ser. No. 769,826, is a continuation-in-part of Ser. No. 638,609, Aug. 7, 1984, Pat. No. 4,571,248, which is a division of Ser. No. 456,880, Jan. 10, 1983, Pat. No. 4,486,321, and a continuation-in-part of Ser. No. 769,912, Aug. 27, 1985, abandoned, and a continuation-in-part of Ser. No. 769,837, Aug. 27, 1985, Pat. No. 4,655,948, and a continuation-in-part of Ser. No. 641,079, Aug. 15, 1984, Pat. No. 4,582,617, which is a continuation-in-part of Ser. No. 519,878, Aug. 3, 1983, abandoned. This application Mar. 7, 1989, Ser. No. 319,841

Int. Cl.[5] C10M *117/04*

U.S. Cl. 252—32.7 E **36 Claims**

1. An improved grease composition comprising a major proportion of a lubricating compound and:

(a) a borated derivative of an organic compound,

(b) a metal or amine derivative of a hydroxy-containing or polyhydroxy-containing carboxylate soap thickener wherein said metal is selected from calcium and lithium, and

(c) a phosphorus and sulfur containing compound selected from the group consisting of zinc dihydrocarbyldithiophosphates; said borated organic compound, said hydroxy-containing thickener and said phosphorus said sulfur containing compound each being present in an amount sufficient to increase the dropping point over the dropping point of a grease without said borated organic compound and said phosphorus sulfur containing compound.

4,961,869

TERNARY AZEOTROPIC COMPOSITIONS OF 2,3-DICHLORO-1,1,1,3,3-PENTAFLUOROPROPANE WITH TRANS-1,2-DICHLOROETHYLENE AND METHANOL

Michael E. Eggers, Chesterton, Ind., and Abid N. Merchant, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 3, 1989, Ser. No. 389,383

Int. Cl.[5] C11D *7/30, 7/50*

U.S. Cl. 252—170 **5 Claims**

1. The azeotropic composition consisting essentially of from about 43–53 weight percent 2,3-dichloro-1,1,1,3,3-pentafluoropropane, about 42–52 weight percent trans-1,2-dichloroethylene and about 3–9 weight percent methanol wherein the composition has a boiling point of about 41.0° C. at substantially atmospheric pressure.

4,961,870

AZEOTROPE-LIKE COMPOSITIONS OF 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE,1,2-DICHLOROETHYLENE, AND ALKANOL HAVING 3 TO 7 CARBON ATOMS

Kane D. Cook, Buffalo; Chien C. Li, East Aurora; Rajat S. Basu, and David P. Wilson, both of Williamsville, all of N.Y., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Dec. 14, 1989, Ser. No. 451,673
Int. Cl.[5] C11D 7/30, 7/50
U.S. Cl. 252—171 12 Claims

1. Azeotrope-like compositions comprising from about 55 to about 70 weight percent 1,1,2-trichloro-1,2,2-trifluoroethane; from about 30 to about 42 weight pe rcent trans-1,2-dichloroethylene; and from about 0.01 to about 3.0 weight percent 2-methyl-2-propanol which boil at about 44.5° C at 760 mm Hg.

4,961,871

POWDERED ABRASIVE CLEANSERS WITH ENCAPSULATED PERFUME

Daniel W. Michael, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 14, 1989, Ser. No. 436,274
Int. Cl.[5] C11D 3/50, 17/00; A61K 7/46
U.S. Cl. 252—174.11 8 Claims

1. A powdered abrasive cleanser comprising:

(a) from about 0.1% to about 10% by weight surfactant;

(b) from about 10% to about 95% by weight water-insoluble abrasive material;

(c) from 0% to about 80% by weight detergency builder; and

(d) from about 0.02% to about 5% perfume by weight contained in water-insoluble microcapsules prepared by a coacervation process between gelatin and polyanionic material selected from the group consisting of: (a) polyphosphates; (b) alginates; (c) carrageenan; (d) carboxymethyl cellulose; (e) polyacrylates; (f) gum arabic; (g) silicates; (h) pectin; (i) Type B gelatin; and (j) mixtures thereof, the walls of said microcapsules containing from about 1% to about 25%, by weight of the core material, of particles that have diameters of less than about 15 microns.

4,961,872

CALCIUM HYPOCHLORITE TABLETS

Richard G. Sinclair, Columbus, Ohio, assignor to The Drackett Company, Cincinnati, Ohio

Division of Ser. No. 117,882, Oct. 26, 1987, abandoned, which is a continuation of Ser. No. 623,268, Jun. 21, 1984, abandoned.
This application Apr. 7, 1989, Ser. No. 336,556
Int. Cl.[5] C02F 1/76; A01N 59/00; C01B 11/06
U.S. Cl. 252—186.37 7 Claims

1. A method of making a calcium hypochlorite tablet comprising the steps of (A) dry mixing from about 50 to about 90% granular calcium hypochlorite and from about 10 to about 50% finely divided water-insoluble resin exhibiting good cold flow characteristics and having a molecular weight from about 10,000 to about 1,000,000, said resin being substantially chemically unreactive with calcium hypochlorite in aqueous media and selected from the group consisting of (a) chlorinated unsaturated hydrocarbons selected from the group consisting of chlorinated polyolefins having five or fewer carbons in the monomeric unit, copolymers of ethylene and vinyl chloride, and copolymers of vinylidene chloride and (b) polyalkenyl acid esters whose esterifying alcoholic moiety contains from 2 to 8 carbon atoms and (B) compressing the dry mix to form a tablet.

4,961,873

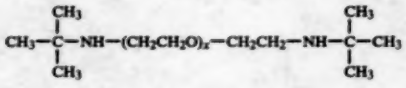
ABSORBENT COMPOSITION CONTAINING A SEVERELY-HINDERED AMINE MIXTURE WITH AMINE SALTS AND/OR AMINOACID ADDITIVES FOR THE ABSORPTION OF H_2S

W. S. Winston Ho; Guido Sartori, both of Annandale, and Eugene L. Stogryn, Edison, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

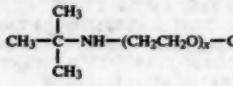
Continuation of Ser. No. 106,782, Oct. 13, 1987, abandoned.
This application Aug. 24, 1989, Ser. No. 398,346
Int. Cl.[5] C09K 3/00
U.S. Cl. 252—189 12 Claims

1. An absorbent composition comprising:

(1) a first severely hindered amine with the formula:



(2) a second severely hindered amine with the formula:



with x being an integer ranging from 2 to 6 and the weight ratio, in the mixture, of the first amine to the second amine ranging from 0.43:1 to 2.3:1,

(3) and an additive including:

(a) an amine salt, said amine salt being the reaction product of a severely hindered amino compound having a cumulative $-E_a$ value greater than 1.75, and a component selected from the group consisting of an acid having at least one pKa of not more than about 7, a decomposable salt of an acid having at least one pKa of not more than 7, a compound capable of forming an acid having a pKa of not more than about 7 and mixtures thereof, said amine salt and said severely hindered amine mixture of (1) and (2) being present in said absorbent composition in a mole ratio of said amine salt to said severely hindered amine mixture of (1) and (2) of at least about 0.2:1, when said amine salt is present and/or

(b) an aminoacid, said aminoacid being a severely hindered aminoacid having a cumulative $-E_a$ value greater than 1.75, said aminoacid and said severely hindered amine mixture being present in said absorbent composition in a mole ratio of said aminoacid to said severely hindered amine mixture of at least about 0.01:1 when said aminoacid is present.

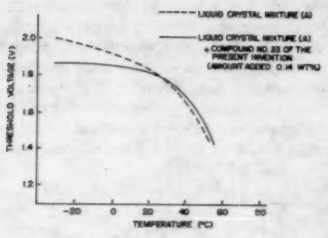
4,961,874

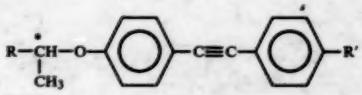
OPTICALLY ACTIVE TOLAN DERIVATIVES

Kiyokumi Takeuchi, Tokyo; Makoto Sasaki, Saitama, and Haruyoshi Takatsu, Tokyo, all of Japan, assignors to Dainippon Ink & Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 61,242, Jun. 15, 1987, Pat. No. 4,814,516. This application Nov. 10, 1988, Ser. No. 269,817
Claims priority, application Japan, Jun. 17, 1986, 61-139276; Aug. 13, 1986, 61-190053
Int. Cl.[5] C09K 19/06
U.S. Cl. 252—299.6 2 Claims

1. In a nematic liquid crystal composition containing an additive to decrease the temperature dependency of threshold voltage of the composition, the improvement wherein the additive is an optically active tolan derivative represented by the formula,





wherein R represents a straight chain alkyl group having 2 to 8 carbon atoms, R^1 represents a straight chain alkoxy group having 1 to 20 carbon atoms, and C* represents an asymmetrical carbon.

4,961,875

CONDENSATE OF AN OPTICALLY ACTIVE-4-(1-HYDROXYETHYL)BIPHENYL WITH AN OPTICALLY ACTIVE ORGANIC ACID

Kouji Ohno; Hiromichi Inoue; Shinichi Saito; Kazutoshi Miyazawa, and Makoto Ushioda, all of Kanagawaken, Japan, assignors to Chisso Corporation, Osaka, Japan

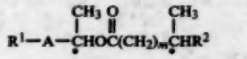
Filed Dec. 14, 1988, Ser. No. 284,118

Claims priority, application Japan, Dec. 15, 1987, 62-317000

Int. Cl.[5] C09K *19/12, 19/52;* G02F *1/13;* C07C *29/66*

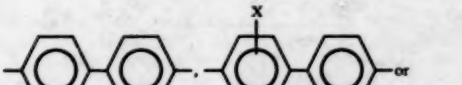
U.S. Cl. 252—299.66 **8 Claims**

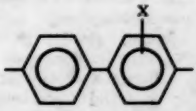
1. A compound expressed by the formula



(I)

wherein R^1 represents an alkyl group or an alkoxy group each of 5 to 10 carbon atoms, R^2 represents an alkoxy group of 1 to 6 carbon atoms, —A— represents





wherein X represents a halogen atom or cyano group, m represents an integer of 0 to 12 and * indicates an asymmetric carbon atom.

4,961,876

LIQUID CRYSTALLINE FERROELECTRIC DERIVATIVES OF BRANCHED ACYCLIC ALPHA-CHLOROCARBOXYLIC ACIDS

Dietrich Demus; Horst Zaschke, both of Halle; Wolfgang Weissflog, Halle-Neustadt; Kristina Mohr, Halle-Neustadt; Saskia Köhler, Halle-Neustadt, and Kerstin Worm, Halle, all of German Democratic Rep., assignors to VEB Werk fuer Fernsehelektronik im VEB Kombinat Mikroelektronik, Berlin, German Democratic Rep.

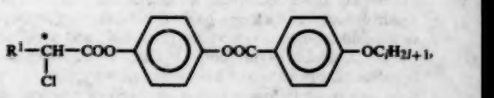
Continuation of Ser. No. 898,284, Aug. 20, 1986, abandoned. This application Sep. 15, 1988, Ser. No. 245,962

Claims priority, application German Democratic Rep., Aug. 26, 1985, 2799446; Aug. 26, 1985, 2799454

Int. Cl.[5] C09K *19/20*

U.S. Cl. 252—299.67 **8 Claims**

1. Liquid crystalline ferroelectric compounds of the formula



wherein R^1 is $(CH_3)_2CH$—, $(CH_3)_2CHCH_2$— or $C_2H_5CH(CH_3)$— and l is an integer 1 to 12.

4,961,877

SOLID SILICONE DEFOAMER

Hirofumi Shimizu, Odawara, and Ken Morishita, Saita, both of Japan, assignors to Dow Corning K.K., Tokyo, Japan

Filed Aug. 30, 1988, Ser. No. 238,674

Claims priority, application Japan, Aug. 31, 1987, 62-215494

Int. Cl.[5] C09K *3/00*

U.S. Cl. 252—358 **4 Claims**

1. A solid silicone defoamer comprising

(A) 5 to 60 parts by weight of a self-emulsifying defoaming agent being a mixture of:

(i) at least 5 weight % of silicone oil having a viscosity of at least 20 centistokes at 25 degrees Centigrade and microparticulate silica, and

(ii) at least 30 weight % of a material selected from the group consisting of polyoxyalkylene and polyoxyalkylene/polysiloxane copolymers,

(B) 95 to 40 parts by weight of wax; said wax being selected from the group consisting of:

(i) a water-insoluble wax which is insoluble in water at room temperature and which has a melting point of at least 35 degrees Centigrade, and

(ii) a water-soluble wax which dissolves and disperses in water at room temperature and which has a melting point of at least 30 degrees Centigrade; and wherein wax (i) is present at less than 60 weight % of the defoamer.

4,961,878

CORROSION INHIBITOR FOR A CLOSED AQUEOUS COOLING SYSTEM

Michael A. Mullins, Wayne, N.J., assignor to Drew Chemical Corporation, Boonton, N.J.

Filed Nov. 9, 1988, Ser. No. 268,915

Int. Cl.[5] C23F *11/08;* C09K *5/00*

U.S. Cl. 252—389.3 **4 Claims**

1. An aqueous composition for inhibiting the corrosion of metals in a closed ferrous and aluminum-containing aqueous cooling system consisting of (a) 1–20 parts of an alkali metal nitrate; (b) 1–20 parts of an alkali metal silicate; (c) 1–20 parts of an amine oxide; (d) 1–10 parts of an acrylate or methacrylate polymer of about 1000–5000 molecular weight; (e) 1–10 parts of tolyltriazole; and (f) the balance water, all parts by weight based on the total weight of the composition.

4,961,879
CONDUCTIVE METAL-FILLED SUBSTRATES VIA DEVELOPING AGENTS

Paul Y. Y. Moy, Des Plaines; William J. E. Parr; Dieter Frank, both of Naperville, all of Ill., and Ronald E. Hutton, Faversham, England, assignors to Akzo America Inc., New York, N.Y.

Filed Jun. 8, 1988, Ser. No. 204,137
Int. Cl.[5] H01B *1/06*
U.S. Cl. 252—512 **30 Claims**

1. A method of forming a conductive metal-filled substrate, comprising:

a. an intermingling step of intermingling metal particles in a deformable substrate, wherein the metal particles are selected from the group consisting of copper, nickel, and combinations thereof, and are intermingled in a quantity sufficient to achieve a conductive three-dimensional substrate;

b. a contacting step of contacting the metal particles with a developing agent comprising a material selected from the group consisting of a long-chain aliphatic tertiary amine; a tertiary phosphine or a tertiary phosphite; and a bifunctional compound having both (1) a first atom which is a trivalent nitrogen atom or a bivalent sulfur atom and (2) at least one second atom which is nitrogen or oxygen, the first and second atoms being separated by at least two other atoms, the bifunctional compound being capable of forming a coordination complex with copper or nickel; and

c. a heating step of subjecting the metal particles and the developing agent to heat, in the substantial absence of oxygen, at a temperature and for a duration sufficient to improve the conductivity of the metal-filled substrate.

4,961,880
ELECTROSTATIC VOLTAGE EXCITATION PROCESS AND APPARATUS

William A. Barker, Los Altos, Calif., assignor to Altran Corporation, Sunnyvale, Calif.

Filed Aug. 31, 1988, Ser. No. 239,146
Int. Cl.[5] G21F *9/00*; G21G *1/00, 1/121, 1/10*
U.S. Cl. 252—626 **10 Claims**

1. A method of energy conversion comprising:

placing a mass of radioactive material in a region;

applying a potential in the range of −50 kV to −5,000 kV to said region so that said region is an equipotential region wherein the radioactive decay of said mass increases upon application of said potential;

capturing the radioactive decay particles in the region whereby the energy of said radioactive particles is transformed to heat energy in the region; and

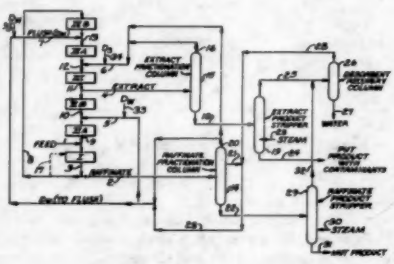
transferring the heat energy in the region to a coolant.

4,961,881
PROCESS FOR SEPARATING TRIGLYCERIDES AND REGENERATING ABSORBENT USED IN SAID SEPARATION PROCESS

John D. Ou, Naperville, Ill., assignor to UOP, Des Plaines, Ill.

Filed Feb. 17, 1988, Ser. No. 156,857
Int. Cl.[5] C09F *5/10*; C11B *3/00*
U.S. Cl. 260—428.5 **5 Claims**

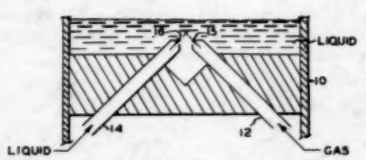
1. A continuous process for separating monounsaturated triglycerides or fatty acids containing impurities from a feed mixture of monosaturated triglycerides or fatty acids and polyunsaturated triglycerides or fatty acids, said process comprising contacting said feed mixture at adsorption conditions with an adsorbent comprising a silver- or copper exchanged aluminosilicate molecular sieve thereby selectively adsorbing said polyunsaturated triglycerides or fatty acids and desorbing, at desorption conditions, said adosrbed triglycerides or fatty acids with first and second desorbents in sequential steps, said first desorbent comprising a weak desorbent having S_p of from 0.2 to 0.4 and a S_h of from 0.1 to 0.3 and effecting the displacement of the monosaturated triglycerides or fatty acids from said adsorbent and said second desorbent comprising a strong desorbent having a polar component solubility parameter (S_p) from 1.3 to 13 and a hydrogen bonding solubility parameter (S_h) of from 0.8 to 21 and effecting the displacement of polyunsaturated triglycerides or fatty acids from said adsorbent, said first desorbent selected from the group consisting of normal paraffins and mixtures of normal paraffins and a minor amount of an ester or a ketone or mixtures thereof, said second desorbent comprising a ketone containing from 0.1 to 5 wt. % hydrogen peroxide or an organic peroxide.



4,961,882
FINE BUBBLE GENERATOR AND METHOD

Phiroz M. Bhagat, and Robert M. Koros, both of Westfield, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 367,911, Jun. 19, 1989, abandoned, which is a continuation of Ser. No. 210,550, Jun. 23, 1988, abandoned. This application Mar. 30, 1990, Ser. No. 502,380
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—124 **9 Claims**



1. A method of forming fine gaseous bubbles in a liquid ambient comprising:

forcing a gas through orifices located in the liquid ambient while simultaneously forcing a liquid through liquid orifices at a velocity sufficient to form jet streams of liquid, the liquid orifices being equal in number to the gas orifices and so oriented that each jet stream of liquid intersects the gas forced through each gas orifice and creates sufficient turbulence where the gas and jet stream of liquid intersect, whereby fine gaseous bubbles are formed.

4,961,883
GLASS BREAK REPAIR APPARATUS VALVE AND METHOD

Gerald Jacino, 85-19 118 St., Kew Gardens, N.Y. 11415, and Anthony Jacino, 17 Normandie La., East Moriches, N.Y. 11940

Filed Mar. 14, 1989, Ser. No. 323,352
Int. Cl.[5] B29C *45/14;* B32B *35/00*
U.S. Cl. 264—36 14 Claims

1. Improved apparatus for repairing a break in glass enabling a syringe to accumulate vacuum and pressure comprising a pedestal, said pedestal including a flange portion, a chamber in said pedestal, said chamber having two openings, one said opening in said flange portion, said other opening including means for receiving a syringe in airtight engagement, said chamber of sufficient size to be a reservoir for glass repair resin, adhesive sealing means to seal said pedestal at said flange in airtight engagement over a break in glass with said chamber in substantial communication with said glass break, a syringe, said syringe including a plunger with a stem, retaining means to retain said stem in a selected fixed position in relation to the body of said syringe, and valve means; said valve means in airtight engagement between said chamber and said syringe; said valve means including a position to seal said syringe and vent said chamber to the atmosphere; said valve means further including a position to communicate said syringe with said chamber, whereby a downward plunger motion pressurizes the resin and an upward plunger motion creates a vacuum between said break and said plunger; said valve means further including a position to seal said chamber and vent said syringe to the atmosphere, whereby a downward plunger motion vents air to the atmosphere, whereby said syringe is actuated to accumulate vacuum and pressure for the infusion of a repair resin into a break in glass.

4,961,884
PROCESS FOR PRODUCING SUBSTRATE OF OPTICAL DISC

Seiichi Watanabe; Yusuke Ishihara, and Tadashi Irie, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 31, 1989, Ser. No. 387,661
Claims priority, application Japan, Jul. 29, 1988, 63-191851
Int. Cl.[5] B29C *45/40*
U.S. Cl. 264—106 6 Claims

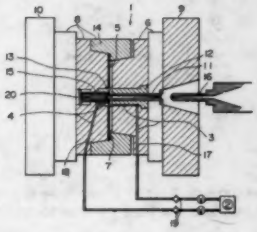
1. A process for producing a substrate of an optical disc, comprising the steps of:

fixing a stamper having protrusions corresponding to pits for recorded information or a groove for tracking onto a movable mold unit;

combining said movable mold unit with a fixed mold unit to form a closed cavity having one side closed by said stamper;

charging a molten molding resin into said cavity;

cooling said resin in said cavity to form a molded substrate; and

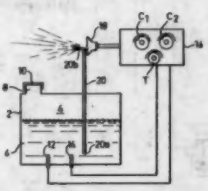


separating said movable mold unit from said fixed mold unit while simultaneously applying pressurized air onto both sides of said substrate.

4,961,885
ULTRASONIC NEBULIZER

Zohar Avrahami, Rehovot; Dov Larom, Herzelia Pituach; Shlomo Zucker, Yavne, and Joseph Gross, Moshav Mazor, all of Israel, assignors to Elecsys Ltd., Herzlia and Product Development(Z.G.S)Ltd., Tel Aviv, both of, Israel

Filed Nov. 24, 1989, Ser. No. 440,960
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—142 20 Claims



1. A nebulizer including a supply container for liquid to be nebulized, an ultrasonic nebulizer nozzle for nebulizing the liquid, and feeding means for feeding the liquid from the supply container to the ultrasonic nebulizer nozzle; characterized in that said feeding means comprises:

an electrolytic cell including electrodes for generating a gas according to the amount of electricity conducted through said electrodes;

a feed tube leading from said supply container to said ultrasonic nebulizer nozzle for feeding liquid thereto according to the amount of gas generated by said electrodes; and

control means for controlling the current flowing through said electrodes, and thereby the quantity of gas generated.

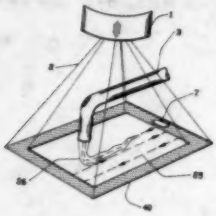
4,961,886
METHOD OF CONTROLLING FLOW BY A RADIATION FORMED DAM

Mark H. Eckstein, and Michael A. Lutz, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jun. 9, 1988, Ser. No. 204,436
Int. Cl.[5] B29C *35/08*
U.S. Cl. 264—22 10 Claims

1. A method for restricting flow of a flowable radiation curable material comprising forming a dam of such material by exposing a portion of the material to radiation of sufficient

intensity to cause curing of the exposed portion, where the flowable radiation curable material is dispensed onto a substrate during exposure by radiation onto the substrate in a pattern which restricts the flow by dam formation.



4,961,887

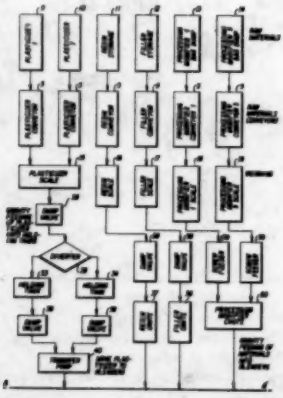
BATCH CONTROL SYSTEM AND PROCESS FOR INSULATING A METALLIC ROD

Michael G. Crumpler; George W. Barker, III; Darrell L. Smith, all of Carrollton; Willard W. Posey, Temple; Howard S. Shepard, Bremen, and Steven R. Campbell, Carrollton, all of Ga., assignors to Southwire Company, Carrollton, Ga.

Filed Aug. 11, 1988, Ser. No. 231,688

Int. Cl.[5] B29C *47/06, 47/92*

U.S. Cl. 264—40.4 **22 Claims**



1. A method for producing metallic rod insulation containing a plurality of ingredients which comprises:

storing said ingredients in containers;

transmitting said ingredients to scales;

establishing and storing in a digital controlling means a predetermined weight setpoint for each of said ingredients;

weighing each of said ingredients in a scale and transmitting current weight data to said controlling means;

obtaining a predetermined weight for each ingredient by subtracting said weight data for each ingredient from said predetermined weight setpoint until the difference is zero;

verifying through a computing means that said predetermined weight has been obtained, and if not obtained contacting an operator to correct said current weight data to equal said predetermined weight; rejecting said ingredients if said current weight data is incorrectible;

conveying said appropriately weighed ingredients to a blender as a result of commands from said controlling means;

providing digital instructions to said blender from said controller means;

blending said ingredients in said blender until they are mixed;

milling the blended ingredients into strips; and

extruding said strips onto the metallic rod to form an insulation around said metallic rod.

13. An apparatus for manufacturing insulation for a metallic rod comprising,

(a) means for storing a plurality of ingredients which will be used in the manufacture of said insulation;

(b) means in direct communication with said storing means for weighing each of said ingredients until a predetermined weight setpoint for each ingredient is obtained;

(c) means in direct communication with said weighing means for blending said ingredients together;

(d) means in series with said blending means for processing said ingredients into insulation around said metallic rod;

(e) digital means for receiving inputs from said weighing means and for issuing commands to a conveying means to supply a correct weight of each ingredient to said blending means; and

(f) computing means interfacing with and issuing commands to said digital means for verifying that a correct amount of material has been sent to the blender means, for directing an operator to correct said amount of material if an incorrect amount was placed into the blender means, and for rejecting said amount of material if correction is unobtainable.

4,961,888

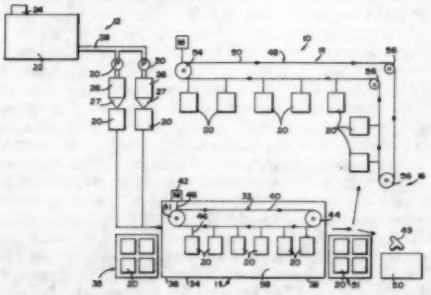
LIQUID SILICONE MOLDING PROCESS

Paul E. Brown, Midland, Mich., assignor to Liquid Molding Systems, Inc., Midland, Mich.

Filed Jul. 28, 1988, Ser. No. 225,486

Int. Cl.[5] B28B *5/02, 13/02, 13/04*

U.S. Cl. 264—40.6 **8 Claims**



1. A method for manufacturing articles in batches from liquid silicone rubber, comprising:

forming a plurality of identical, reusable first molds, each shaped to form a first one of the articles;

forming a plurality of identical, reusable second molds, each shaped to form a second one of the articles;

providing an elongated oven having a substantially constant, preselected temperature which is sufficiently high to cure each of the first and second articles over a specified period of time;

providing first and second continuously feeding conveyors positioned to transport the first and second molds through the oven, and including means for independently controlling the speed of each of the first and second conveyors in accordance with the particular article being conveyed through the oven;

positioning a filling station adjacent an upstream end of the conveyors;

positioning an unloading station adjacent a downstream end of the conveyors;
placing the first and second molds at the filling station;
manually filling a preselected number of the first and second molds with liquid silicone rubber;
adjusting the speed of the first conveyor in accordance with the particular characteristics of the first articles such that the time that each of the first articles takes to travel through the oven on the first conveyor is substantially equal to the time necessary to cure each of the first articles at the preselected oven temperature;
adjusting the speed of the second conveyor in accordance with the particular characteristics of the second articles, such that the time that each of the second articles takes to travel through the oven on the second conveyor is substantially equal to the time necessary to cure each of the second articles at the preselected oven temperature;
sequentially connecting the filled first molds with the first conveyor adjacent the upstream end thereof, and thereby transporting the same through the oven, and heating the liquid silicone rubber in each of the first molds to fully cure the first articles;
sequentially connecting the filled second molds with the second conveyor adjacent the upstream end thereof, and thereby transporting the same through the oven, and heating the liquid silicone rubber in each of the second molds to fully cure the second articles;
sequentially disconnecting the filled first and second molds from the first and second conveyors adjacent the downstream end thereof;
positioning the first and second molds disconnected from the first and second conveyors on the unloading station;
cooling the first and second molds in the unloading station to a temperature which will permit mutual handling of the same;
releasing the cured first and second articles from the first and second molds; and
returning the emptied first and second molds to the filling station, whereby a variety of different types and shapes of articles can be efficiently manufactured in batches at reduced cost.

4,961,889

PROCESS FOR PRODUCING INORGANIC FIBER

Hidekimi Kadokura; Masashi Harakawa, both of Niihama, and Nagatoshi Nogami, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 789,963, Oct. 3, 1985, abandoned. This application Jul. 28, 1989, Ser. No. 385,955
Claims priority, application Japan, Apr. 10, 1984, 59-72471
Int. Cl.[5] C04B *35/64*
U.S. Cl. 264—63 **1 Claim**

1. A process for producing an inorganic fiber superior in stretchability and mechanical strength, which comprises heating a polymetalloxane in solid form at 25° C. to a temperature of 40° to 250° C. to prepare a spinning liquid having a viscosity of 1 to 3000 poises; spinning the spinning liquid to form a precursor fiber; and baking the precursor fiber.

4,961,890

METHOD OF PREPARING COMTROLLED RELEASE FENOFIBRATE

Jean-Francois Boyer, Houdan, France, assignor to Ethypharm, Houdan, France

Division of Ser. No. 83,409, Aug. 10, 1987, Pat. No. 4,800,079. This application Oct. 12, 1988, Ser. No. 256,836
Claims priority, application France, Aug. 8, 1986, 86 11540
Int. Cl.[5] B28B *11/06*; A61K *9/22*
U.S. Cl. 264—113 **11 Claims**

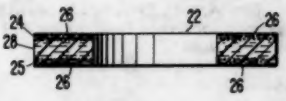
1. A method for preparing a medicine involving a controlled release of fenofibrate in aqueous medium, said medicine being in the form of a granule that comprises an inert core in its center, a protective outer coating and an intermediate layer based on fenofibrate, said process comprising forming said intermediate layer on said inert core by performing in a time duration of the order of one or two minutes three sequential steps (i), (ii) and (iii) as follows:
(i) dampening said inert core with a solution based on a binder comprising a solvent selected from the group consisting of water and alcohols,
(ii) then projecting onto said dampened core in a single layer fenofibrate crystalline microparticles that have diameters less than 30 microns,
(iii) and thereafter drying before said solution based on said binder dissolves said fenofibrate microparticles, and repeating said three steps in sequence until said intermediate layer is formed so that said fenofibrate microparticles therein are included in the pores of an inert matrix constituted by said binder.

4,961,891

METHOD OF MAKING HIGH COMPRESSIBILITY GASKET MATERIAL

Stefan Pitolaj, Palmyra, N.Y., assignor to Garlock, Inc., Palmyra, N.Y.

Division of Ser. No. 253,185, Oct. 4, 1988, Pat. No. 4,900,629. This application Nov. 15, 1989, Ser. No. 436,797
Int. Cl.[5] B29C *65/02*; B32B *27/06*
U.S. Cl. 264—113 **9 Claims**



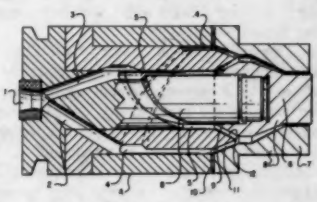
1. A method for forming a gasket material which includes:
forming first and second sheets of unsintered polytetrafluoroethylene having fully embedded, hollow, rigid collapsible particles dispersed therein and bonded thereto,
forming a third sheet of unsintered polytetrafluoroethylene,
positioning said third sheet between said first and second sheets to form a three layered structure,
sintering said three layered structure at temperatures above the gel point of polytetrafluoroethylene to fuse the three layers into a unitary gasket structure.

4,961,892

DEVICE FOR EXTRUDING HOMOGENEOUS PLASTIC ARTICLES AND PROCESS MANUFACTURING HOMOGENEOUS ARTICLES THEREWITH

Bernard Prevotat, Le Chesnay, France, assignor to Atochem, Paris, France

Filed Apr. 21, 1989, Ser. No. 341,543
Claims priority, application France, May 4, 1988, 88 05999
Int. Cl.[5] B29C *47/20*
U.S. Cl. 264—209.8 **11 Claims**



1. A distribution head for compensating for differences in a stream of plastic received from an extruder comprising an inlet for receiving a stream of fluid plastic and an outlet for dis-

charging said stream, channel means in said distribution head extending from said inlet to said outlet, means including dividing means within said channel means for dividing said stream into at least two pairs of sidestreams, each pair of sidestreams having a first sidestream and a second sidestream, each of said first sidestreams extending by discrete paths separately and directly through said distribution head and each of said second sidestreams extending by discrete curved paths separately and indirectly through said distribution head whereby said indirect paths are longer than said direct paths.

7. A process for manufacturing homogeneous plastic articles comprising feeding a stream of fluid plastic into a distribution head, splitting said stream into a first substream and a second substream, splitting said first substream into a third substream and a fourth substream, splitting said second substream into a fifth substream and a sixth substream, conducting said third substream and said fifth substream separately over paths of a first predetermined length, conducting said fourth substream and said sixth substream separately over paths of a second predetermined different length, combining said third substream with said sixth substream, and combining said fourth substream with said fifth substream.

4,961,893

METHOD FOR MANUFACTURING MEMORY CARDS

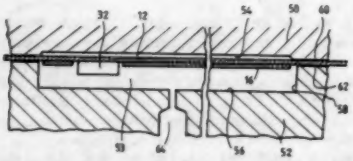
René Rose, Voisin le Bretonneux, France, assignor to Schlumberger Industries, Montrouge, France

Filed Apr. 21, 1989, Ser. No. 341,182

Claims priority, application France, Apr. 28, 1988, 88 05671; Sep. 16, 1988, 88 12088

Int. Cl.[5] B29C *45/14*

U.S. Cl. 264—247 **7 Claims**



1. A method of manufacturing a memory card comprising a card body having two mutually parallel main faces and a memory module including an access face disposed in one of the main faces of the card body, comprising the steps of:

providing a mold whose mold cavity defines the outside shape of said card and including two main walls for defining said two faces of the card body;

providing a support element having two oppositely facing surfaces;

providing a memory module having an access face;

fixing the access face of said memory module to one of the surfaces of the support element;

placing said support element in said mold such that its periphery is fixed to said mold with the memory module being in said mold cavity;

injecting a plastic material into said mold so that the plastic material fills said mold cavity and presses the other of the surfaces of the support element against one of the two main walls of the mold cavity so that substantially the entirety of said memory module, except for its access face, is embedded in the plastic material; and

unmolding the part obtained in this way, and forming one of said two main faces of the card body by separating the support element from said part, thereby causing said memory module to be inserted in the card body with said access face of the memory module being disposed in said one main face of the card body.

4,961,894

PROCESS FOR PRODUCING SYNTHETIC RESIN MOLDED ARTICLES

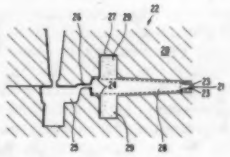
Seizo Yabe, Tokyo, and Kunio Yamazaki, Osaka, both of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 13, 1988, Ser. No. 256,939

Claims priority, application Japan, Oct. 13, 1987, 62-256214

Int. Cl.[5] B29C *45/16*

U.S. Cl. 264—259 **3 Claims**



1. A process for process for producing a synthetic resin molded article composed of a film or sheet and an injected resin part, which comprises fitting a film or sheet to a cavity of a mold in position, which mold has a gate, and wherein a resin passageway which has at least two sides is provided at the gate of the mold and then injection molding a thermoplastic resin, wherein said mold has ancillary means which is provided in the at least two sides of the resin passageway at the gate of the mold or in the vicinity of the gate of the mold in the form of wings and a magnet buried therein at least at a position of the resin passageway of the mold at the gate of the mold or in the vicinity of the gate of the mold or at positions symmetrical about said resin passageway to form a magnet fixing part, and said film or sheet is processed into a shape containing wings of the mold and has a magnet or a ferromagnetic substance fitted thereto at a position or positions corresponding to said magnet fixing part of the mold.

4,961,895

PROCESS AND APPARATUS FOR MOLDING STRUCTURES COMPRISING LONGITUDINALLY JUXTAPOSED SLATS

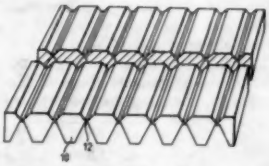
André Klein, Lijtweg 1201, 2341 HE, Oegstgeest, Netherlands

Filed Jun. 15, 1988, Ser. No. 206,742

Claims priority, application United Kingdom, Jun. 16, 1987, 8714011; Sep. 25, 1987, 872257C

Int. Cl.[5] B29C *45/13, 45/20, 45/76*

U.S. Cl. 264—40.6 **19 Claims**



1. A process for the welding together of two thermoplastics components, comprising arranging the components in juxtaposition with a narrow gap therebetween, advancing along said gap a heated member to melt the opposing surfaces of the two components, and extruding into said gap, behind said heated member, a bead of molten thermoplastics material to unite with said molten opposing surfaces and form, on solidification of the thermoplastics material, a welded joint between said components.

3. Apparatus for welding together two thermoplastic com-

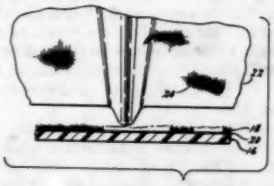
ponents including a heatable member adapted at least partially to melt the material of the edges to be welded, an extrusion die located rearwardly of the heatable member and means adapted to introduce, through the extrusion die, a molten extrudate of a material compatible with the material of the sheets to be welded between the adjacent edges and means to move the apparatus relatively to the sheet material in advance of the weld formed by the apparatus, the arrangement being such that, in operation, the temperature of said heatable member and of said extrudate can be separately adjusted.

4,961,896

METHOD OF MAKING SIMULATED FABRIC

James P. Constantino, Mt. Clemens, Mich., assignor to Cadillac Products, Inc., Troy, Mich.

Filed Nov. 4, 1988, Ser. No. 267,451
Int. Cl.[5] B29C *59/02*
U.S. Cl. 264—293 **12 Claims**



1. A method for manufacturing a simulated fabric, said method comprising the steps of:

(a) providing a substrate having a layer of flocked material applied thereto, said layer of flocked material having a predetermined thickness;

(b) contacting said flocked material with a surface of a mold, said mold surface including a predetermined finely detailed simulated fabric pattern formed thereon;

(c) heating said substrate and said layer of flocked material to one or more predetermined temperatures to soften said substrate and said layer of flocked material; and

(d) applying one or more predetermined amounts of pressure to said substrate and said layer of flocked material for one or more predetermined amounts of time, to cause a portion of said layer of flocked material to plastically deform to a predetermined thickness less than said thickness of said layer of flocked material and thereby acquire substantially the same pattern as said pattern on said mold surface.

4,961,897

SHOCK ABSORBING DRIVE MECHANISM FOR NUCLEAR REACTOR ABSORBING BARS

Gérard Chevereau, Le Raincy, France, assignor to Framatome, Courbevoie, France

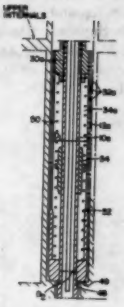
Filed Feb. 10, 1989, Ser. No. 308,500
Claims priority, application France, Feb. 11, 1988, 88 01643
Int. Cl.[5] G21C *7/20*
U.S. Cl. 376—234 **3 Claims**

1. In a liquid cooled nuclear reactor having fixed upper internals, said upper internals having an abutment means, a drive mechanism for an absorbent bar comprising a drive shaft supporting the bar and movable vertically within said upper internals and a device for shock absorption upon fall of the shaft and bar, said device having:

a hydraulic cylinder located in the upper internals, formed with a bore comprising an upper portion of larger diameter provided with discharge holes spaced longitudinally along the bore and with a lower portion of smaller diameter slidably receiving said shaft,

a piston fixed to said shaft, having a sliding fit in said upper portion and defining a shock absorbing chamber with said upper portion, said lower portion and said shaft, said chamber having exhaust means comprising said discharge holes located to be progressively covered by the piston during downward movement thereof within the cylinder, and

a resetting spring biasing said piston towards a top position where it uncovers said discharge holes,



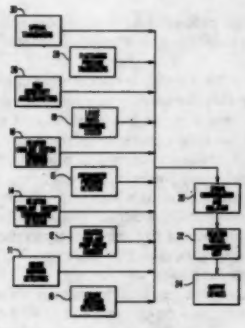
said cylinder and said shaft being provided with mutually cooperating seating means permitting the shaft to lift the cylinder and said abutment means of said upper internals being arranged to receive the cylinder and to retain it when the shaft, during its downward movement thereof, moves beyond a predetermined lever.

4,961,898

REACTOR INTERNALS AND CORE SUPPORT MONITORING SYSTEM

William T. Bogard, Irwin; George J. Bohm, Pittsburgh; William Claramitaro; Sam S. Palusamy, both of Murrysville; Norman R. Singleton, Pittsburgh, and John A. Tgortorice, Export, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 30, 1988, Ser. No. 238,051
Int. Cl.[5] G21C *17/00*
U.S. Cl. 376—245 **12 Claims**



1. A method for diagnosing conditions of reactor internals and core support structures in a nuclear reactor, comprising the steps of:

(a) detecting vibration of reactor internals;

(b) receiving signals representing system data including at least two among pressurizer pressure, reactor coolant pump motor current, reactor coolant system pressure, reactor coolant system temperature and reactor coolant system flow rate; and

(c) automatically evaluating the vibration of the reactor internals detected in step (a) based upon all of the signals

received in step (b) to diagnose the condition of the reactor internals and core support structures.

4,961,899

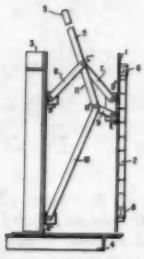
MULTIPLE-CABLE CONNECTING DEVICE FOR A NUCLEAR REACTOR

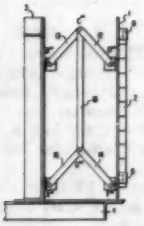
Denis J. Altman, Jeannette, and John S. Urban, Pitcairn, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 643,510, Aug. 23, 1984, abandoned. This application Jan. 16, 1990, Ser. No. 465,562

Int. Cl.[5] **G21C** *19/00*

U.S. Cl. 376—260 **13 Claims**





1. In a nuclear reactor, a device for connecting a plurality of energy conveying lines to a nuclear reactor head structure comprising:

a pair of matching multiple cooperative connector plates for disengageably connecting an energy source with the reactor head structure; at least one of said connector plates being a movable connector plate; each of the multiple connector plates containing a multiplicity of individual connectors, each individual connector being one of a matching pair of connectors that are engaged when the matching multiple connector plates are brought together, each connector of the matching pair being mounted in corresponding locations on the opposing matching multiple connector plates; and

an extendable and retractable linkage means secured to a support structure on one end and to said movable connector plate at the other end for accurately guiding the movable connector plate along a precise, predetermined path, such that the connectors of each pair of matching connectors meet in correct alignment; said linkage means comprising:

a kite linkage and two separate unitary parallelogram linkages; each of the linkages being separately articulated to the movable connector plate and operating in parallel planes; each said plane being parallel to the direction of motion of the movable connector plate; the kite linkage being articulated to the movable connector plate along a center line thereof, and the two parallelogram linkages being articulated to the movable connector plate adjacent opposite edges thercof disposed on either side of the kite linkage;

the kite linkage comprising first, second, third, fourth and fifth links and first, second, third, fourth, fifth and sixth pivots; the first links being articulated to the movable connector plate at the first pivot thereon and connected to the second link at the second pivot; the second link being connected to the support structure at the third pivot; said first link and said second link being of equal length; the third link being connected to the movable connector plate at a fourth pivot spaced from the first pivot; the third link being connected to and fifth pivot to a fourth link; the fourth link being connected to the support structure at the sixth pivot spaced from the third pivot; the fifth link connecting the fifth pivot point and the second pivot point; the fifth link being extended through the second pivot point to form an actuator arm for extending or collapsing said kite linkage upon applying a force to said arm; the distance between the second pivot and the fifth pivot equalling the length of the first link; the distance between the first pivot and the fourth pivot being equal to the length of the third link; the length of the fourth link being equal to the distance from the third pivot to the sixth pivot; the length of the fourth link multiplied by the length of the third link equalling the square of the length of the first link; and

each parallelogram linkage comprising sixth, seventh, eight, ninth and tenth links and seventh, eight, ninth, tenth, eleventh and twelfth pivots; the sixth link being articulated to the movable connector plate at the seventh pivot thereon and to the seventh link at an eighth pivot; the seventh link being connected to the support structure at a ninth pivot; the eighth link being connected to the movable connector plate at a tenth pivot spaced from the seventh pivot and to the ninth link at the eleventh pivot; the ninth link being articulated to the support structure at a twelfth pivot spaced from the ninth pivot; and the tenth link joining the eighth and eleventh pivots; the sixth, seventh, eighth and ninth links being of equal length and of the same length as the first and second links of the kite linkage; the tenth link being of a length equal to the distance between the seventh pivot and the tenth pivot and to the distance between the ninth pivot and the twelfth pivot; the tenth link being equal in length to the fourth link of the kite linkage.

4,961,900

CAN FOR RECEIVING A CLUSTER OF FUEL RODS CONTAINING NUCLEAR FUEL

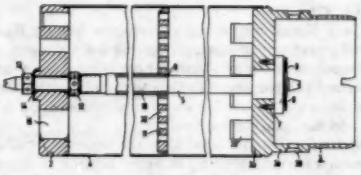
Wolfgang Hummel, Weisendorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 30, 1989, Ser. No. 330,775

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 3811104

Int. Cl.[5] **G21F** *5/00*

U.S. Cl. 376—272 **6 Claims**



6. Can for receiving a cluster of spent fuel rods containing nuclear fuel, comprising a can top, a can jacket secured on said can top, a can bottom loosely covered by said can jacket, said can top having a lower surface facing said can bottom, a tie rod disposed inside said can jacket, means in the form of a push

plate disposed inside said can jacket at a right angle to said tie rod for pushing spent fuel rods out of the can jacket, said tie rod extending loosely through said push plate and having an upper end releasably secured to said can top and a lower end secured to said can bottom, and a stop body releasably attached to said upper end of said tie rod at said lower surface of said can top for stopping movement of said push plate inside said can jacket.

4,961,901

PROCESS AND APPARATUS FOR MANUFACTURING DIAPHRAGMS

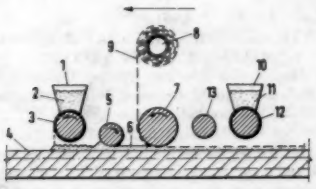
Heinz Wüllenweber, Frankfurt am Main; Peter Kohl, Neuberg; Herbert Jung, Oberursel, all of Fed. Rep. of Germany; Jorgen Borchardt, Troistorrents, Switzerland; Wolfgang Bickle, Reilingen, Fed. Rep. of Germany; Jürgen Braus, Walldorf, Fed. Rep. of Germany, and Hans-Joachim Hiedemann, Cologne, Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt, Fed. Rep. of Germany

Filed Apr. 18, 1989, Ser. No. 339,747

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1988, 3813743

Int. Cl.[5] B22F *5/00*

U.S. Cl. 419—2 **8 Claims**



1. In a process for the manufacture of a diaphragm having a thickness of from 0.3 to 3.0 mm and comprising a carrier and a porous ceramic layer having a thickness of from 0.1 to 2.8 mm joined to the carrier, the improvement wherein the carrier is formed by applying a powder layer to a support by feeding a metal powder in a first feed direction onto the support, wherein the powder is flowable with difficulty and consists of irregularly shaped particles, moving the applied powder layer under a distributing roller rotating in a direction opposite to the first feed direction to impart a uniform thickness to the powder layer, rolling or pressing a wire net onto the uniform thickness powder layer and compacting the uniform thickness powder layer by 30 to 60% at the same time and firing the compacted powder layer and net in an oxidizing atmosphere of from 800° to 1500° C. for 1 to 30 minutes.

4,961,902

METHOD OF MANUFACTURING A CERAMIC/METAL OR CERAMIC/CERAMIC COMPOSITE ARTICLE

Thomas M. Clere, Willowick, Ohio; Gholamreza J. Abbaschian, Gainesville, Fla.; Douglas J. Wheeler, Cleveland Heights, and Albert L. Barnes, Wickliffe, both of Ohio, assignors to Eltech Systems Corporation, Boca Raton, Fla.

Continuation-in-part of Ser. No. 825,402, Feb. 3, 1986, abandoned. This application Jan. 6, 1987, Ser. No. 945,116

Int. Cl.[5] B22F *1/00*

U.S. Cl. 419—12 **25 Claims**

1. A method of manufacturing a composite article comprising a ceramic or metal product of a second metal and a ceramic product of a first metal, wherein the first metal is one or more of the metals of Group IVb, Vb or VIb of the periodic table, said method being initiated with a particulate mixture of reactants that includes a second metal reactant that in the manufacture goes through peritectic decomposition, and the sintering, which method comprises the steps of:

providing a mixture of solid, particulate reactants in finely divided form;

heating said mixture up to a first temperature that is below peritectic decomposition temperature, at a moderate rate of increasing temperature;

reducing said moderate rate of increasing temperature and continuing heating above said first temperature, but below peritectic decomposition temperature at a lowest rate of increasing temperature of less than 10° C. per minute;

maintaining said lowest rate of increasing temperature of less than 10° C. per minute at least substantially through peritectic decomposition of said second metal reactant;

greatly elevating the rate of temperature increase following said lowest rate to a most substantial rate of increasing temperature of above 20° C. per minute;

maintaining said most substantial rate of increasing temperature of above 20° C. per minute to attain a maximum reaction sintering temperature; and cooling the resulting reaction product resulting from said maximum reaction sintering temperature.

4,961,903

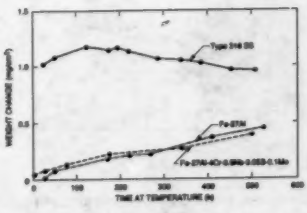
IRON ALUMINIDE ALLOYS WITH IMPROVED PROPERTIES FOR HIGH TEMPERATURE APPLICATIONS

Claudette G. McKamey, Knoxville, and Chain T. Liu, Oak Ridge, both of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Mar. 7, 1989, Ser. No. 319,771

Int. Cl.[5] C22C *38/06*

U.S. Cl. 420—79 **25 Claims**



1. An alloy of the DO_3 type consisting essentially of 26–30 at.% aluminum, 0.5–10 at.% chromium, 0.02–0.3 at.% boron and the balance iron.

4,961,904

STEEL WITH A COMPOSITION OF IRON, CARBON, SILICON, PHOSPHORUS AND MOLYBDENUM

John M. Beswick, Montfoort, Netherlands, assignor to SKF Industrial Trading & Development Co. B.V., Netherlands

Filed Apr. 6, 1989, Ser. No. 334,243

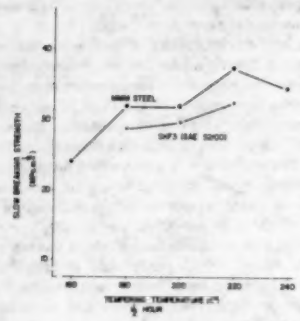
Claims priority, application Netherlands, Apr. 8, 1988, 8800900

Int. Cl.[5] C22C *38/12*

U.S. Cl. 420—123 **2 Claims**

1. Steel with a composition consisting of about 0.85–0.95

percent by weight carbon, up to about 0.1 percent by weight silicon, up to about 0.015 percent by weight phosphorus, about



0.20–0.4 percent by weight molybdenum and the remainder by weight being iron.

4,961,905

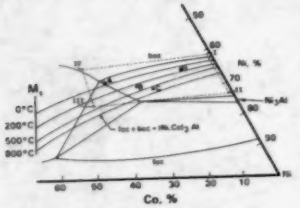
NICKEL ALUMINIDE MATERIALS HAVING TOUGHNESS AND DUCTILITY AT LOW TEMPERATURES

Chi C. Law, South Glastonbury, and Scott M. Russell, East Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 13, 1988, Ser. No. 283,688

Int. Cl.[5] C22C *19/00*

U.S. Cl. 420—460 **2 Claims**



1. A composition, based on NiAl, capable of forming at least 20 vol.% of a martensitic structure, comprising:

a composition falling within the area defined by points I, II, III and IV in the FIGURE.

4,961,906

LIQUID HANDLING

Mario R. Andersen, Veradale; Thomas O. Tiffany, Spokane, both of Wash., and Mario J. Gangitano, Anaheim, Calif., assignors to Fisher Scientific Company, Pittsburgh, Pa.

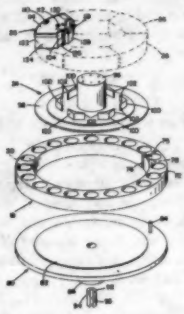
Division of Ser. No. 599,509, Apr. 12, 1984, Pat. No. 4,761,268. This application Jun. 27, 1988, Ser. No. 192,005

Int. Cl.[5] B01L *3/00*; G01N *9/30, 35/02*

U.S. Cl. 422—102 **2 Claims**

1. A reagent container for use in a sample and reagent transfer system,

said reagent container being of sector shaped configuration, comprising a generally vertical curved outer wall, generally vertical side walls that are disposed at an angle to one another, a generally horizontal top wall with a first port through which a probe carried by said transfer structure may be inserted, a generally horizontal bottom wall that has a well portion below and aligned with said first port in said top wall, a dry well channel in said container, said dry well channel being open at its bottom, and a second port in said top wall aligned with said dry well channel through which a second probe carried by said transfer



structure may be inserted concurrently with the insertion of a first probe carried by said transfer structure through said first port in said top wall.

4,961,907

CATALYTIC CRACKING APPARATUS EMPLOYING MIXED CATALYST SYSTEM

Joseph A. Herbst, Turnersville; Hartley Owen, Belle Mead, both of N.J., and Paul H. Schipper, Wilmington, Del., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 92,243, Sep. 2, 1987, Pat. No. 4,871,446, which is a continuation-in-part of Ser. No. 903,186, Sep. 3, 1986, abandoned, and a continuation-in-part of Ser. No. 903,351, Sep. 3, 1986, abandoned, and a continuation-in-part of Ser. No. 903,189, Sep. 3, 1986, abandoned. This application Mar. 13, 1989, Ser. No. 322,262

Int. Cl.[5] F27B *15/08*

U.S. Cl. 422—144 **10 Claims**

1. A catalytic cracking apparatus adapted to crack a feed by contact of said feed with a conventional fluidized catalytic cracking (FCC) catalyst, having an average particle density, in a reaction zone to produce cracked products which are removed from said apparatus and spent catalyst which is stripped in a stripping zone within said apparatus to produce stripped catalyst which is regenerated in a catalyst regeneration zone to produce regenerated cracking catalyst which is recycled to said reaction zone to crack additional feed, characterized by

a cracking reactor means adapted to accept said feed and a catalyst mixture comprising said conventional FCC catalyst and an additive catalyst, said additive catalyst comprising particles having an average particle density which is different from the average particle density of said conventional FCC catalyst;

a cracked product/catalyst mixture separation means adapted to separate cracked products from a mixture of spent conventional FCC catalyst and additive catalyst;

a stripping zone comprising an inner vessel defining an inner dense phase fluidized bed region within an outer dense phase fluidized bed region, said inner and outer dense phase fluidized bed regions being in open fluid communication with a common dilute phase region, said inner vessel being adapted to receive said mixture of spent conventional FCC catalyst and additive catalyst and, in a lower section of said inner vessel, stripping gas inlet means through which stripping gas is fed in an amount sufficient to fluidize said inner region and to displace from said inner vessel particles of lesser density over into said outer region whereby said mixture is resolved into a stripped, spent catalyst rich dense phase fluidized bed and an addi-

tive catalyst rich dense phase fluidized bed within said inner and outer regions;

an additive catalyst recycle means adapted to transport said additive rich catalyst from said stripping zone to said reactor; and

a stripped, spent catalyst transfer means adapted to transport said stripped spent catalyst from said stripping zone to said catalyst regeneration zone.

4,961,908

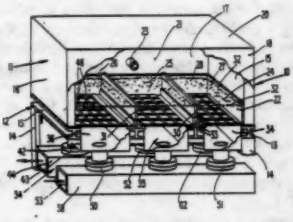
COMPACT COMBUSTION APPARATUS

Rodney L. Pennington, Morris Township, Morris County, and James H. Mueller, Morristown, both of N.J., assignors to Regenerative Environmental Equip. Co., Morris Plains, N.J.

Filed Nov. 10, 1987, Ser. No. 119,110

Int. Cl.[5] B01D *53/34*

U.S. Cl. 422—173 **4 Claims**



1. Apparatus for incinerating industrial exhaust gases on a thermal recovery principle, comprising:

(a) an oven having an upper portion and a lower portion;

(b) the upper portion being a combustion chamber having combustion means therein;

(c) the lower portion being comprised of a plurality of heat exchange sections;

(d) the heat exchange sections each having a gas permeable member at a lower end thereof and a pile of refractory heat exchange elements disposed on the gas permeable member in a manner to allow gas flow through the elements;

(e) with adjacent heat exchange sections being separated by a common flow separation wall means;

(f) with separate associated plenum means for each said heat exchange section, located therebeneath and in gas flow communication therewith;

(g) means for delivering a flow of exhaust gases to be incinerated into at least one plenum, upwardly through its associated heat exchange section into the combustion chamber and then delivering the gaseous products of combustion downwardly through another heat exchange section and through its associated plenum means to discharge from the apparatus; including

(h) means for alternating the direction of flow through said heat exchange sections and associated said plenum means;

(i) wherein said flow separation wall means includes conduit means therein for conveying gases there through.

4,961,909

PROCESS FOR THE MANUFACTURE OF COPPER ARSENATE

Daniel A. D. Boateng, Montrose, Canada, assignor to Comino Ltd., Vancouver, Canada

Filed Nov. 9, 1989, Ser. No. 433,868

Int. Cl.[5] C25B *1/14*; C01G *28/02*

U.S. Cl. 423—87 **21 Claims**

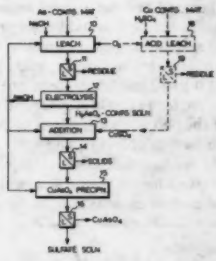
1. A process for the manufacture of copper arsenate with a reduced water content comprising the steps of:

(a) subjecting an arsenic- and impurity-containing material capable of yielding an arsenate solution to an oxidative pressure leach with sodium hydroxide with the formation of a sodium arsenate solution containing dissolved impurities and a leach residue;

(b) separating said sodium arsenate solution from said leach residue;

(c) subjecting said sodium arsenate solution to electrolysis with membranes for the removal of at least a portion of sodium constituent and for that at least partial conversion into an arsenic acid-containing solution and a sodium hydroxide solution;

(d) mixing said arsenic acid-containing solution with a solution of copper sulfate containing impurities for the formation of a copper and arsenic-containing solution, the precipitation of impurities, and without the precipitation of copper arsenate;



(e) separating said copper and arsenic-containing solution from precipitated impurities;

(f) precipitating copper arsenate in the separated copper and arsenic-containing solution by the addition of sodium hydroxide solution with the formation of sodium sulfate solution; and

(g) separating precipitated copper arsenate from said sodium sulfate solution for the recovery of copper arsenate, said removal of sodium constituent resulting in a reduced water content of the recovered copper arsenate.

4,961,910

RECOVERY OF TUNGSTEN AND MOLYBDENUM

Clarence D. Vanderpool, Towanda, and John A. Powers, New Albany, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 881,560, Jul. 3, 1986, abandoned. This application Jul. 6, 1987, Ser. No. 70,744

Int. Cl.[5] C01G *39/00, 41/00*; C22B *3/00*

U.S. Cl. 423—53 **12 Claims**

7. A method for recovering one or more of the metals of tungsten and molybdenum, said method comprising:

(a) filtering a solution containing a first set of elements selected from the group consisting of tungsten, molybdenum, and combinations thereof and a second set of elements selected from the group consisting of arsenic, phosphorus, silicon, and combinations thereof, through a cellulose material whereby at least some of the elements from said first and second sets are retained on said cellulose material;

(b) digesting said cellulose material containing the retained elements in a mineral acid selected from the group consisting of hydrochloric acid having a concentration of at least about 4 normal and sulfuric acid having a concentration of at least about 9 normal at a temperature of at least about 50° C. for a sufficient time to form a digestion solution containing the major portion of any tungsten and molybdenum which is present in said material and a digestion residue;

(c) separating said digestion solution from said residue; and

(d) recovering tungsten and molybdenum from said digestion solution.

4,961,911

PROCESS FOR REDUCING CARBON MONOXIDE EMISSIONS FROM A FLUIDIZED BED TITANIUM DIOXIDE CHLORINATOR

Paul G. Reis, Wilmington, and Michael J. Dunbar, New Castle, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 2, 1989, Ser. No. 318,150

Int. Cl.[5] C01G *23/02*

U.S. Cl. 423—72 **10 Claims**

1. Process for reducing the amount of carbon monoxide emitted from a fluidized bed reactor for chlorinating titanium bearing material containing iron oxide comprising:

(a) feeding coke, titanium bearing material containing iron oxide, and chlorine to the reactor, said chlorine being fed within about 0 to 10 feet of the base of the reactor,

(b) maintaining the feed rates in step (a) and the conditions of operation of the bed so that the iron oxide is substantially converted to ferrous chloride, and

(c) additionally feeding sufficient chlorine to the reactor within about 0 to 8 feet of the surface of the bed to convert at least some carbon monoxide to carbon dioxide.

4,961,912

PASSIVATION OF ELEMENTAL PHOSPHORUS CONTAINED IN WASTE PONDS

Auston K. Roberts, Chino; William E. Trainer, Anaheim, both of Calif.; Mark L. Blumenfeld, New York City, N.Y., and David L. Biederman, Columbia, Tenn., assignors to Rhone-Poulenc Basic Chemicals Co., Shelton, Conn.

Continuation-in-part of Ser. No. 78,426, Jul. 27, 1987, Pat. No. 4,746,499, which is a continuation-in-part of Ser. No. 894,529, Aug. 8, 1986, Pat. No. 4,686,094. This application Dec. 31, 1987, Ser. No. 140,059

The portion of the term of this patent subsequent to Aug. 11, 2004, has been disclaimed.

Int. Cl.[5] C01B *25/01, 25/02, 25/04*

U.S. Cl. 423—322 **4 Claims**

1. A process for the passivation of elemental phosphorus-containing wastes contained in waste ponds rendering them substantially less pyrophoric, which comprises bringing the elemental phosphorus-containing wastes contained in the waste pond in contact with an oxygen-containing gas to render them substantially less pyrophoric.

4,961,913

PRODUCTION OF ULTRASTRUCTURAL CERAMICS

Thomas M. Sullivan, P.O. Box 4615, San Diego, Calif. 92104

Filed Aug. 31, 1988, Ser. No. 238,735

Int. Cl.[5] C04B *35/58*; C01B *21/00*

U.S. Cl. 423—351 **51 Claims**

1. A process for the production of polymeric nitride ceramic precursors from nitride precursors comprising conducting a polymerizing reaction under conditions subjecting said nitride precursors to supercritical pressure and supercritical temperature.

2. A process for the production of polymeric nitride ceramic precursors from organometallic precursors comprising conducting a polymerizing reaction under conditions subjecting said organometallic precursors to supercritical pressure and supercritical temperature.

29. A process for the production of ceramic polymer precursors useful of making carbide ceramics which comprises reacting, under conditions of supercritical pressure and supercritical temperature, a compound chosen from the group consisting of organometallics, organic salts, hydrides and mixtures thereof in the presence of a hydrocarbon chosen from the group consisting of methane, ethane, propane, butane, pentane, hexane, heptane, octane, nonane, decane, as well as a hydrocarbon containing 1 to 20 carbon atoms.

4,961,914

METHOD OF PREPARING HYDROGEN CYANIDE

Michael Witzel, Frankfurt; Peter Kleinschmit, Hanau; Wolf-Dieter Pfeifer, Brühl, all of Fed. Rep. of Germany; Carl Voigt, Oakville, Canada, and Peter Albers, Hanau-Steinheim, Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 14, 1988, Ser. No. 218,858

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1987, 3723535

Int. Cl.[5] C01C *3/02*

U.S. Cl. 423—376 **9 Claims**

1. A method of preparing hydrogen cyanide with the so-called BMA method by reacting aliphatic hydrocarbons having 1–4 carbon atoms with ammonia in the presence of a catalyst, said method comprising the following steps:

(1) forming a preliminary catalyst stage by applying aluminum ions and noble metal ions to the surface of a molded body of aluminum oxide from a catalytic solution, wherein the ratio of the noble metal ions to the aluminum ions in the catalystic solution is between 0.001 to 1 up to 0.1 to 1, drying the molded body and reducing with hydrogen,

(2) introducing the preliminary catalyst stage obtained in this manenr into a hydrogen cyanide reactor,

(3) heating the reactor to a temperature in the range of 1000° to 1350° C.,

(4) introducing a mixture of ammonia and hydrocarbon in amounts approximately in accordance with the stoichiometry of their reaction into the reactor,

(5) initiating the reaction to hydrogen cyanide with the preliminary catalyst stage, and

(6) continuing this reaction, for one-half to one hour after start-up time, until there is formed a cohesive layer of aluminum nitride in situ.

4,961,915

AUTOMATIC CHEMISTRY MACHINE

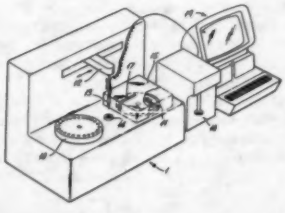
William J. Martin, Sale, England, assignor to National Research Development Corporation, London, England

Filed Dec. 31, 1985, Ser. No. 815,054

Claims priority, application United Kingdom, Jan. 7, 1985, 8500294

Int. Cl.[5] C07H *15/12, 17/00*; B01J *14/00*

U.S. Cl. 422—116 **27 Claims**



1. An automatic chemistry machine comprising:

a rotatable reaction surface,

means for supporting and rotating said reaction surface at a first loading speed and at least at a second faster mixing speed, said reaction surface consisting essentially of one or more reagent paths having a predetermined length,

reagent supply means for supplying reagents,

means for depositing predetermined microliter amounts of selected reagents at predetermined spaced apart points along the length of said reagent path,

each of said reagent paths consisting essentially of including

a substantially horizontally longitudinally extending reaction area having a bottom surface situated on a common plane and terminating at a radially positioned outer end including means defining a cavity and being further comprised of reagent constraining means for constraining the deposited reagents so that upon rotation of said reaction surface at said mixing speed the deposited reagents will be constrained chordally yet flow freely over the reaction path in a radial direction and mix together.

22. A method of automatically carrying out a sequence of chemical reactions under specific conditions with specific reagents including the steps of depositing volumes of five microliters or less of each of a plurality of selected reagents on a reaction surface for said reactions, rotating said reaction surface to mix the deposited reagents, controlling the temperature of the reagents and the reaction surface and maintaining the desired reaction surface conditions for a predetermined reaction time.

4,961,916

SAMPLING DEVICE

Jacques Lesage, St. Hubert, and Guy Perrault, Laval, both of Canada, assignors to IRSST-Institut de Recherche en Sante et en Securite du Travail du Quebec, Montreal, Canada

Filed Jun. 2, 1988, Ser. No. 201,176

Int. Cl.[5] G01N *1/24*; B01D *53/30*

U.S. Cl. 422—88 **5 Claims**

1. In a sampling device for selectively collecting gaseous isocyanates and aerosol isocyanates that are contained in polluted air, said device being of the type comprising a cartridge provided with an inlet, an outlet and filtering means, a vacuum pump and means for connecting said pump to the outlet of the cartridge to cause some polluted air to be drawn through said filtering means, the improvement wherein said filtering means consists of there successive filters and wherein:

the first filter is made with polytetrafluoroethylene of such a porosity that it collects aerosol pollutants but is permeable to gas,

the second filter is positioned downstream of the first filter and consists of a porous substrate impregnated with an effective amount of a secondary amine that reacts with the gaseous isocyanates to produce therewith urea derivatives, said second filter being of such a porosity as to be permeable to air but not to said derivative; and

the third filter is positioned downstream of the second filter and consists of a porous material that is permeable to gas and rigid enough to prevent deformation of the first and second filters.

4,961,917

METHOD FOR REDUCTION OF NITROGEN OXIDES WITH AMMONIA USING PROMOTED ZEOLITE CATALYSTS

John W. Byrne, Edison, N.J., assignor to Engelhard Corporation, Edison, N.J.

Filed Apr. 20, 1989, Ser. No. 341,405

Int. Cl.[5] B01J *8/00*; C01B *21/00*

U.S. Cl. 423—239 **7 Claims**

1. A method for the reduction of nitrogen oxides with ammonia which comprises:

contacting a gaseous stream containing nitrogen oxides and ammonia at a temperature of from about 250° C. to 600° C. with a catalyst composition comprising: (a) a zeolite having a silica to alumina ratio of at least about 10, and a pore structure which is interconnected in all three crystallographic dimensions by pores having an average kinetic pore diameter of at least about 7 Angstroms; and (b) a promoter selected from the group consisting of iron and copper in the amount of from about 0.1 to 30 percent by weight, calculated as the metal and based on the total weight of the metal and the zeolite.

4,961,918

PROCESS FOR PRODUCTION OF CHLORINE DIOXIDE

Maria Norell, Linjevägen; Anders Dahl, Ängsövägen, and Ursula Söderberg, Fyrväpplingsvägen, all of Sweden, assignors to Eka Nobel AB, Surte, Sweden

Filed Feb. 15, 1989, Ser. No. 310,619

Claims priority, application Sweden, Oct. 11, 1988, 8803606-6

Int. Cl.[5] C01B *11/02*; C07C *29/74*

U.S. Cl. 423—479 **10 Claims**

1. A process for production of chlorine dioxide, comprising the steps of:

reacting in a reaction vessel an alkali metal chlorate, sulfuric acid and purified raw methanol as a reducing agent in proportions to generate chlorine dioxide in a reaction medium maintained at a temperature from about 50° C. to about 100° C. and subjected to a subatmospheric pressure sufficient to effect evaporation of water;

withdrawing a mixture of chlorine dioxide and water vapor from an evaporation region in the reaction vessel; and

precipitating alkali metal sulfate in a crystallization region in the reaction vessel;

wherein the purified raw methanol is obtained by purifying raw methanol from the waste product of a pulp process, the purifying process consisting of diluting the raw methanol with water to form a non-polar phase and a methanol-water phase, separating the phases, and contacting the methanol-water phase with an adsorbing agent, thereby forming purified raw methanol.

4,961,919

MONOCRYSTALLINE MATERIAL HAVING GARNET STRUCTURE

Leonardus A. H. Van Hoof, Eindhoven, Netherlands; Dieter Mateika, Ellerbek; Horst Laudan, Hamburg, both of Fed. Rep. of Germany; Johannes A. Pistorius, and Jan Haisma, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 6, 1989, Ser. No. 294,311

Claims priority, application Netherlands, Jan. 25, 1988, 8800155

Int. Cl.[5] C01G *23/00*

U.S. Cl. 423—598 **2 Claims**

1. A monocrystalline material having a garnet structure, characterized in that the lattice constant of the material is smaller than 11.9 Å and the composition of the material corresponds to the formula

$$\{Mn_{3-c-b}Mg_cM_b\}[Al_{2-a}M'_a](Ge_{3-d-e}Si_dM''_e)O_{12}$$

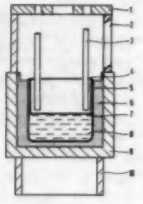
wherein

M is at least one element selected from the group consisting of In^{3+}; Li^{+}; Fe^{2+}; Sc^{3+}; Zr^{4+} and Hf^{4+};

M' is at least one element selected from the group consisting of Ge^{4+} and Ti^{4+}

M'' is at least one element selected from the group consisting of B^{3+} and Al^{3+}

and, wherein



$0.0 \leq a \leq 0.4$

$0.0 \leq b \leq 0.4$

$0.0 \leq c \leq 0.2$

$0.0 \leq d \leq 0.5$

$0.0 \leq e \leq 0.6$

$0.2 \leq a+d \leq 0.8$.

4,961,920

PHOTOTHERAPEUTIC MONOVINYL AND DIVINYL ETHER-LINKED DIMERS

A. David Ward, Burnside, Australia, assignor to Luminis Pty, Ltd., Adelaide, Australia

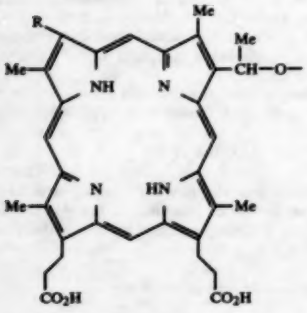
Filed May 16, 1989, Ser. No. 352,793

Claims priority, application Australia, Dec. 8, 1988, PJ1860

Int. Cl.[5] A61K *49/00, 31/40, 37/04;* **C07D** *259/00*

U.S. Cl. 424—9 **9 Claims**

1. A compound of the formula



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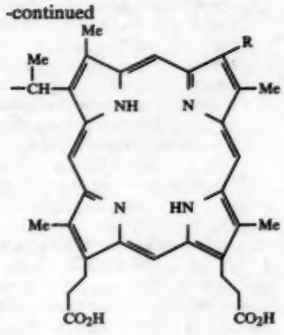


wherein one R is vinyl and the other R is 1-hydroxyethyl or vinyl and the pharmaceutically acceptable esters and salts thereof, in isolated form.

4,961,921

NON-AEROSOL PUMP SPRAY COMPOSITIONS

Jui-Chang Chuang, Wayne; Edward Walls, Jr., Cranford, and Stephen C. Johnson, Newton, all of N.J., assignors to GAF Chemicals Corporation, Wayne, N.J.

Filed Apr. 21, 1989, Ser. No. 341,322

Int. Cl.[5] A61K *7/00*

U.S. Cl. 424—47 **11 Claims**

1. A non-aerosol pump hair spray composition capable of being applied by the user as a fine spray mist which dries rapidly and provides effective hair holding power without nozzle clogging consisting essentially of from about 6 to 20% by weight of a hair fixative resin which is a terpolymer of a vinyl ester, a water insoluble or water miscible alkyl maleate half ester and an acrylate or methacrylate ester of a saturated, hydroxylated, bicyclic hydrocarbon, having a relative viscosity of from 1.10 to below 1.30, the carboxyl groups of which are 10 to 100% neutralized with a water soluble base and about 65 to 94% ethanol or aqueous ethanol solvent.

4,961,922

COMPLEXES BASED ON ANTHRALIN AND A STEROL, A PROCESS FOR OBTAINING THEM AND THEIR USE IN THERAPEUTICS AND COSMETICS

Braham Shroot, Antibes; Daniéle Caron; Jean-Claude Caron, both of Valbonne, and Alain Brzokewicz, Antibes, all of France, assignors to Centre International De Recherches Dermatolociques, Valbonne, France

Filed Apr. 13, 1989, Ser. No. 337,800

Claims priority, application Luxembourg, Apr. 14, 1988, 87 201

Int. Cl.[5] A61K *7/06, 7/075*

U.S. Cl. 424—70 **14 Claims**

1. A complex based on anthralin and a sterol, characterized in that its melting point is 10° to 25° C. lower than that of the constituent of the complex melting at the lowest temperature and that the proportion of anthralin varies between 10 and 90 mol %.

4,961,923

IRRIGANTS FOR USE IN SCALING AND/OR LAVAGE APPARATUS

John B. Heyde, Milford, Del., assignor to Dentsply Management Corp., York, Pa.

Continuation of Ser. No. 157,672, Feb. 19, 1988, abandoned. This application Oct. 2, 1989, Ser. No. 418,780

Int. Cl.[5] A61K *7/16, 7/24;* **A61C** *1/07*

U.S. Cl. 424—49 **14 Claims**

1. A dental irrigant comprising:

(a) about 70 to about 92 percent, by weight of the irrigant, of water;
(b) about 5 to about 25 percent, by weight of the irrigant, of ethyl alcohol;
(c) about 0.5 to about 30 percent, by weight of the irrigant, of hydrogenated starch hydrolysate; and
(d) about 0.01 to about 10 percent, by weight of the irrigant, of surfactant;
said irrigant having the characteristics of being a free flowing liquid substantially free of polyols having substantial humectant tendencies, substantially non-foaming and relatively non-sticky.

4,961,924

STABILIZED STANNOUS FLUORIDE TOOTHPASTE

Christopher H. Suhonen, San Jose, Calif., assignor to Gillette Canada Inc., Montreal, Canada

Filed Nov. 15, 1989, Ser. No. 437,470
Int. Cl.[5] A61K *7/18*
U.S. Cl. 424—52 **3 Claims**

1. In a method for formulating an aqueous toothpaste consisting essentially of water-unstable stannous fluoride, the improvement comprising the step of dispersing the stannous fluoride in an aqueous solution of an alkyl vinyl ether and maleic anhydride or maleic acid copolymer as the essential stannous ion chelate forming stabilizer, the amount of said copolymer being sufficient to stabilize the stannous fluoride concentration during formulation against stannous oxide precipitation by providing oxidation protection to the stannous ion.

4,961,925

HAIR PREPARATION COMPOSITION

Yoshio Tsujino, Izumisano; Yoshiharu Yokoo, Sagamihara; Kuniaki Sakato, Atsugi, and Hiroshi Hagino, Tokyo, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

PCT No. PCT/JP88/00315, § 371 Date Nov. 29, 1988, § 102(e) Date Nov. 29, 1988, PCT Pub. No. WO88/07360, PCT Pub. Date Oct. 6, 1988
PCT Filed Mar. 30, 1988, Ser. No. 283,600
Claims priority, application Japan, Mar. 31, 1987, 62-78184
Int. Cl.[5] A61K *7/09, 7/13;* A45D *7/04*
U.S. Cl. 424—71 **8 Claims**

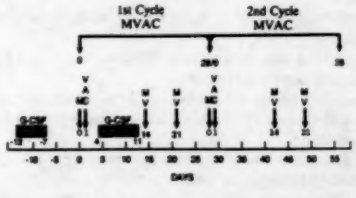
3. An oxidation composition for permanent waving preparation, which comprises a dielectron reducing oxidase utilizing oxygen as an acceptor, a donor of said oxidase, water and a cosmetically acceptable vehicle.

4,961,926

METHODS FOR PREVENTION AND TREATMENT OF MUCOSITIS WITH GRANULOCYTE COLONY STIMULATING FACTOR

Janice L. Gabrilove, New York, N.Y., assignor to Sloan-Kettering Institute For Cancer Research, New York, N.Y.

Filed Nov. 19, 1987, Ser. No. 122,784
Int. Cl.[5] A61K *37/02;* A61M *36/00*
U.S. Cl. 424—85.1 **20 Claims**



1. A method of preventing mucositis in a subject susceptible to mucositis comprising administering to the subject a prophylactically effective amount of granulocyte colony stimulating factor or a polypeptide analog thereof having substantially the same amino acid sequence and the activity of naturally occurring granulocyte colony stimulating factor.

4,961,927

CLEAR SOLUTION CONTAINING LYSOZYME HYDROCHLORIDE AND DIPOTASSIUM GLYCYRRHIZINATE

Yoshio Kogure, Honjou, Japan, assignor to Eisai Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1987, Ser. No. 125,536
Claims priority, application Japan, Dec. 19, 1986, 61-303163
Int. Cl.[5] A61K *37/54, 31/70;* C12N *9/36*
U.S. Cl. 424—94.3 **8 Claims**

1. A clear aqueous solution which comprises a solution of lysozyme hydrochloride, dipotassium glycyrrhizinate, and at least one member selected from the group consisting of sodium chloride, potassium chloride, calcium chloride, magnesium chloride, sodium phosphate, potassium phosphate, sodium citrate, potassium citrate, sodium carbonate and potassium carbonate dissolved in water, said solution having a pH of 5 to 9.

4,961,928

SYNTHETIC, PLASMA-FREE, TRANSFUSIBLE STORAGE MEDIUM FOR RED BLOOD CELLS AND PLATELETS

Stein Holme, Virginia Beach, and William A. L. Heaton, Norfolk, both of Va., assignors to American Red Cross, Washington, D.C.

Continuation-in-part of Ser. No. 841,435, Mar. 19, 1986, Pat. No. 4,695,460. This application Sep. 21, 1987, Ser. No. 99,012
Int. Cl.[5] A61K *35/18;* A01N *1/02*
U.S. Cl. 424—533 **26 Claims**

1. A process for preserving red blood cells in a sterile, plasma-free red blood cell storage medium comprising:
preparing a physiologically compatible, aqueous electrolyte solution, one liter of said electrolyte solution having:
between about 3.0 grams and about 25.0 grams of dextrose;
between about 3.0 grams and about 6.0 grams of sodium citrate; and
between about 2.0 grams and about 4.2 grams of sodium bicarbonate;
suspending red blood cells in said red blood cell storage medium, said red blood cell storage medium being isotonic and having a pH in a range of between about 6.8 and about 7.4, whereby a substantial concentration of said red blood cells remain viable for at least about 49 days at a temperature of at least about 4° C.

4,961,929

PROCESS OF REPELLING DOGS AND DOG REPELLENT MATERIAL

Max A. Gurvich; Robert W. Parent, both of Seattle, and Eugene H. Brandli, Issaquah, all of Wash., assignors to Pace National Corporation, Kirkland, Wash.

Continuation-in-part of Ser. No. 456,205, Jan. 7, 1983. This application Oct. 12, 1983, Ser. No. 541,382
Int. Cl.[5] A61K *35/78*
U.S. Cl. 424—196.1 **12 Claims**

1. The process of repelling dogs from a selected location which comprises applying in the area of the location a composition containing material selected from the group consisting of pine oil and pine-needle oil.

4,961,930

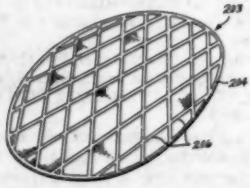
PET PAD OF THERMOPLASTIC CONTAINING MATERIALS WITH INSECTICIDE

Perdelwitz, Jr., Lee E., Tacoma; Robert H. Young, Maple Valley; Earl D. Hasenwinkle; Ron H. Iff, both of Puyallup, and Amar H. Neogi, Seattle, all of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Apr. 29, 1988, Ser. No. 188,291

Int. Cl.[5] A61K *9/70*

U.S. Cl. 424—411 15 Claims



4. A pet pad having a body with a field bounded by a peripheral edge margin and a peripheral edge, the body comprising a thermobonded mixture of thermoplastic containing fibers, other fibers and an insecticide the mixture comprising a core and in which the body has a liquid permeable facing sheet and a liquid impermeable backing sheet mounted to the core.

4,961,931

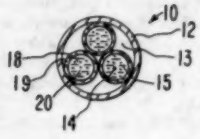
METHOD FOR THE MANAGEMENT OF HYPERPLASIA

Patrick S.-L. Wong, Palo Alto, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 895,611, Aug. 11, 1986, abandoned, which is a continuation-in-part of Ser. No. 714,421, Mar. 21, 1985, Pat. No. 4,629,449, which is a division of Ser. No. 402,953, Jul. 29, 1982, abandoned. This application Sep. 9, 1988, Ser. No. 242,249

Int. Cl.[5] A61K *31/505*

U.S. Cl. 424—430 2 Claims



1. A method for administering an estrogenic composition for estrogen replacement in a woman exhibiting a decrease in estrogen secretion, and for administering a progestational composition for the management of endometrial hyperplasia in said woman, which method comprises:

(a) placing in the vagina of said woman a vaginal dispenser adapted and shaped for easy placement and comfortable retention in the vagina, the dispenser comprising:

(1) a multiplicity of tubes with each tube comprising a wall that surrounds an internal space, said wall comprising a member selected from the group consisting of olefin, vinyl, condensation, addition and rubber diffusion and microporous polymers;

(2) a composition in the internal space, said composition comprising about 2 mcg to 7.5 g of an estrogenic steroid, pharmaceutically acceptable mass transfer carrier for said steroids;

(b) administering the estrogenic steroid through the wall from the dispenser into the vagina in a therapeutically effective amount for replacing the estrogen in said woman; and,

(c) administering the progestational steroid through the wall in a therapeutically effective amount from the dispenser for substantially lessening endometrial hyperplasia in said woman.

4,961,932

PLURALITY OF TINY PILLS IN LIQUID DOSAGE FORM

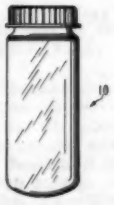
Felix Theeuwes, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 112,189, Oct. 26, 1987, Pat. No. 4,853,229. This application Apr. 12, 1989, Ser. No. 337,197

The portion of the term of this patent subsequent to Aug. 1, 2006, has been disclaimed.

Int. Cl.[5] A61K *9/52, 9/66*

U.S. Cl. 424—455 20 Claims



1. A delivery system for the controlled delivery of a beneficial drug to an animal, the delivery system comprising:

(a) a tiny pill comprising:

(1) a composition comprising a beneficial drug, and

(2) a wall comprising a composition for controlling the release of the beneficial drug from the tiny pill, which wall surrounds the composition comprising the beneficial drug:

(b) a carrier comprising a pharmaceutically acceptable liquid;

(3) a plurality of tiny pills in the carrier; and,

(4) means in the carrier for delaying the release of the beneficial drug from the tiny pills.

4,961,933

PREPARATION FOR RELIEF OF MUSCLE AND JOINT ACHES

Longino S. Campos Pino, 103 Thayer St., New York, N.Y. 10040

Filed Dec. 14, 1987, Ser. No. 132,219

Int. Cl.[5] A61K *33/34, 35/78*

U.S. Cl. 424—630 5 Claims

1. A method of preparing an aqueous solution for treating aching muscles and joints of a mammalian host by external application of said aqueous solution thereto, said method comprising the steps of:

(a) blending approximately 80 grams of capsicum in approximately 280 grams of water to form a puree;

(b) adding to said puree approximately 18 grams of copper filings (U.S.P.) to form a first admixture;

(c) boiling said first admixture for approximately three minutes;

(d) allowing said first admixture to cool to ambient temperature;

(e) shaking said first admixture over a period of approximately forty-eight hours;

(f) adding about 125 grams of 70% solution of isopropyl alcohol to said first admixture forming a second admixture thereby;

(g) shaking said second admixture over a period of approximately twenty-four hours; and

(h) filtering said second admixture to remove substantially all of said copper solids to provide said aqueous solution.

4,961,934

MILK REPLACER FOR INFANT CATTLE AND METHOD FOR BREEDING INFANT CATTLE USING THE SAME

Tetsuji Iwasaki, Wakayama, and Yoshihisa Mori, Osaka, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Feb. 13, 1989, Ser. No. 309,650

Claims priority, application Japan, Feb. 12, 1988, 63-30509; Feb. 24, 1988, 63-41228

Int. Cl.[5] A23K *1/00*

U.S. Cl. 426—002 6 Claims

4. A method of breeding infant cattle which comprises feeding infant cattle on an aqueous solution or dispersion of a milk replacer composition comprising a skim milk powder and/or a soybean meal as a main component, wherein said aqueous solution or dispersion contains at least 0.1% by weight of a triglyceride of a medium-chain fatty acid having from 6 to 10 carbon atoms, wherein the skim milk powder and/or soybean meal is present in an amount of 60 to 85% by weight.

4,961,935

SUGARLESS, SUBSTANTIALLY ANHYDROUS CHEWING GUM COMPOSITIONS AND METHODS FOR PREPARING SAME

Subraman R. Cherukuri, Towaco, N.J.; Daniel A. Orlandi, Flushing, N.Y.; Steven M. Faust, Stanhope, and J. Francisco Zamudio-Tena, Morristown, both of N.J., assignors to Warner-lambert Company, Del.

Continuation-in-part of Ser. No. 137,396, Dec. 23, 1987, abandoned. This application Apr. 12, 1989, Ser. No. 336,678

Int. Cl.[5] A23G *3/30*

U.S. Cl. 426—3 43 Claims

1. A sugarless, substantially anhydrous chewing gum composition which comprises:

(a) a gum base;

(b) a low-moisture pick-up, non-hygroscopic bulking agent comprising a racemic mixture of alpha-D-glucopyranosyl-1,6-mannitol and alpha-D-glucopyranosyl-1,6-sorbitol in an amount from about 10% to about 70% by weight;

(c) a softening agent; and

(d) a sweetening agent;

(e) wherein the chewing gum composition contains no more than about 2.5% water, by weight of the total chewing gum composition; and

(f) wherein said non-hygroscopic bulking agent provides to the gum composition a firm texture and reduced moisture absorption, and maintains the gum composition in its substantially anhydrous state.

4,961,936

PROCESS FOR PREPARATION OF OIL-FREE FISH MEAL AND RECOVERY OF POLYUNSATURATED FATTY ACIDS

David Rubin, San Diego, Calif., assignor to Century Laboratories, Inc., Port Washington, N.Y.

Filed Apr. 28, 1987, Ser. No. 43,458

Int. Cl.[5] A23J *1/04*

U.S. Cl. 426—7 19 Claims

1. A process for recovering substantially oil-free fish meal, consisting essentially of the steps of:

comminuting fish or fish by-products;

hydrolyzing substantially all of the membrane phospholipids present in the fish or fish by-products at a temperature not substantially higher than ambient temperature, without use of organic solvent or using an organic solvent in an amount which is not greater than that sufficient to catalyze the hydrolysis;

adding a strong acid to the reaction product of said hydrolyzing step to release free fatty acids from the mixture and to form an organic phase, containing free fatty acids, and an aqueous phase, containing dissolved proteins;

removing said free fatty acids by separating the organic phase from the aqueous phase; and

drying the aqueous phase to recover a substantially oil-free fish meal.

4,961,937

A COMPOSITION OF FLOURS CONTAINING VITAL GLUTEN AND SOLUBLE OAT DIETARY FIBER AND A BAKED PRODUCT PRODUCED THEREFROM

Harry W. Rudel, 801 N. Broad St., Elizabeth, N.J. 07208

Filed Nov. 22, 1988, Ser. No. 276,408

Int. Cl.[5] A21D *13/00*

U.S. Cl. 426—19 28 Claims

1. A composition of flours comprising gluten flour in amounts sufficient to produce a vital gluten content of at least 17% of the dry mix and a milled oat groat product in amounts sufficient to produce a soluble oat dietary fiber content of from 0.2% to 56.0% of the vital gluten content of the dry mix.

4,961,938

PREPARATION OF CHEESE WITH RENNIN FROM RECOMBINANT MICROBIAL CELLS

Kirk J. Hayenga, San Bruno; Virgil B. Lawlis, Pacifica, and Bradley R. Snedecor, Brisbane, all of Calif., assignors to Genentech, Inc., San Francisco, Calif.

Continuation of Ser. No. 855,827, Apr. 24, 1986, abandoned, which is a division of Ser. No. 513,883, Jul. 14, 1983, abandoned, which is a continuation-in-part of Ser. No. 452,227, Dec. 22, 1982, abandoned. This application Jun. 3, 1987, Ser. No. 57,392

The portion of the term of this patent subsequent to Jun. 19, 2007, has been disclaimed.

Int. Cl.[5] A23C *19/032, 19/00;* C12N *15/09, 9/52*

U.S. Cl. 426—36 1 Claim

1. A process for preparing cheese which comprises:

i. obtaining active rennin which has been produced in a recombinant microbial host cell as preprorennin, prorennin or rennin in the form of an insoluble refractile body by:

(a) rupturing the recombinant microbial host cell;

(b) isolating insoluble refractile bodies from the recombinant host cell;

(c) solubilizing the refractile bodies; and

(d) recovering active rennin;

ii. adding the obtained active rennin to milk;

iii. allowing the milk to coagulate to produce curd and whey; and

iv. converting the curd of step iii. into cheese.

4,961,939

DEODORIZED WATER-IN-OIL EMULSION CONTAINING FISH OIL

Richard L. Antrim, and James B. Taylor, both of Sparta, N.J., assignors to Nabisco Brands, Inc., East Hanover, N.J.

Filed Jun. 2, 1989, Ser. No. 360,630

Int. Cl.[5] A23D *7/00;* A23C *15/00*

U.S. Cl. 426—61 11 Claims

1. A food product comprising a water-in-oil or an oil-in-water emulsion having an oil phase and a water or milk phase wherein said oil phase comprises fish oil and said water or milk phase of said emulsion comprises a stabilizer of

(a) aldehyde dehydrogenase plus alcohol dehydrogenase plus nicotinamide adenine dinucleotide,

(b) aldehyde oxidase plus alcohol oxidase plus catalase, or

(c) xanthine oxidase plus alcohol oxidase plus catalase,

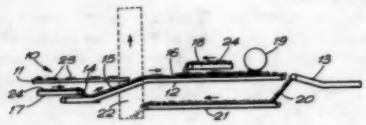
wherein said stabilizer is present in such amounts as to prevent or retard the formation of malodorous alcohols and/or aldehydes in such fish oils during the shelf life of said emulsion.

4,961,940

COATED FOODSTUFF

Nils E. Hansson, Bjuv, Sweden, assignor to Nestec S.A., Vevey, Switzerland

Continuation of Ser. No. 925,281, Oct. 30, 1986, Pat. No. 4,808,423. This application Aug. 30, 1988, Ser. No. 238,726
Claims priority, application European Pat. Off., Jan. 22, 1986, 86 100821.7
The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.
Int. Cl.[5] A23P *1/08*
U.S. Cl. 426—89 11 Claims



1. A product of a process for preparing a frozen prefried food product which comprises coating a foodstuff with a batter, coating particles of fresh root vegetables with a predusting flour and tempering the flour-coated vegetables to approximately a freezing temperature, coating the battered foodstuff with the tempered flour-coated vegetables, frying the vegetable coated foodstuff and then deep-freezing the fried coated foodstuff.

4,961,941

SHELF-STABLE MULTI-TEXTURED COOKIES

Mark V. Cocco, Bloomfield; Robert E. Ross, Wayne, and Robert R. Thulin, Wyckoff, all of N.J., assignors to Nabisco Brands, Inc., East Hanover, N.J.

Continuation of Ser. No. 157,158, Feb. 11, 1988, abandoned, which is a continuation of Ser. No. 16,521, Feb. 6, 1987, abandoned, which is a continuation of Ser. No. 742,454, Jun. 7, 1985, abandoned, which is a continuation-in-part of Ser. No. 702,083, Feb. 15, 1985, abandoned. This application Mar. 27, 1989, Ser. No. 330,938
The portion of the term of this patent subsequent to Oct. 9, 2007, has been disclaimed.
Int. Cl.[5] A21D *13/00*
U.S. Cl. 426—94 20 Claims

1. A baked, soft cookie comprising:

(a) a first portion having a soft and moist textured crumb structure baked from a first cookie dough comprising flour, shortening or fat, and a humectant for imparting softness to the first portion, and

(b) a second soft crumb portion having a firmer textured crumb structure than said first portion and said second portion being laminated to said first portion, wherein said second portion is baked from a second cookie dough comprising sucrose, flour, shortening or fat, and a humectant in a total amount which is greater than 25% by weight, based upon the total sugar solids content of said second dough, selected from the group consisting of non-sucrose sugar humectants, non-sugar humectants and mixtures thereof, the water-holding capacity of the humectant of said second portion being less than the water-holding capacity of the humectant of said first portion at the same shelf-stable water activity of the cookie, wherein: (1) the humectant content of the dough baked to said second portion, and (2) the difference in said water-holding capacities are effective for promoting said firmer texture, the sucrose content of the dough being less than 75% by weight based upon the total sugar solids content present in said second dough portion, said cookie having a water activity of less than about 0.7, and said second portion having a firmer textured crumb structure than said first portion for at least about two months when the cookie is packaged in a closed package.

4,961,942

SHELF-STABLE MULTI-TEXTURED COOKIES

Mark V. Cocco, Bloomfield; Robert E. Ross, Wayne, and Robert R. Thulin, Wyckoff, all of N.J., assignors to Nabisco Brands, Inc., East Hanover, N.J.

Continuation of Ser. No. 702,083, Feb. 15, 1985, abandoned. This application May 2, 1988, Ser. No. 191,771
The portion of the term of this patent subsequent to Oct. 9, 2007, has been disclaimed.
Int. Cl.[5] A21D *13/00*
U.S. Cl. 426—94 32 Claims

1. A cookie having a shelf stable plurality of textures comprising:

(a) a first portion having a soft or chewy textured crumb structure baked from a filler cookie dough comprising flour, shortening or fat, and a humectant for imparting softness or chewiness to the first portion, and

(b) a second portion having a firmer and tender textured crumb structure laminated to said first portion, said second portion being baked from a casing cookie dough comprising flour, sucrose, shortening or fat, and at least one member selected from the group consisting of lactose and dextrose in a total amount which is greater than 25% by weight, based upon the total sugar solids content of the casing dough, the sucrose content of the casing dough being less than 75% by weight, based upon the total sugar solids content of the casing dough,

said cookie having a water activity of less than about 0.7, the dual texture of a firmer and tender second portion and a soft or chewy first portion being shelf stable for at least two months when the cookie is packaged in a closed container.

4,961,943

PROCESS OF PREPARING CEREAL-COATED DRIED FRUIT

Michele Blanthorn, Hoboken, N.J., and Glen Labaw, Greenwich, Conn., assignors to Nabisco Brands, Inc., East Hanover, N.J.

Filed Jan. 22, 1990, Ser. No. 467,858
Int. Cl.[5] A23L *1/212*
U.S. Cl. 426—102 31 Claims

1. A process for producing a coated fruit having a substantially continuous coating enrobing the fruit, wherein the coating has a crunchy texture, the process comprising:

(a) coating dried fruit pieces with a liquid coating comprising at least one melted fat which is solid or semi-solid at room temperature and is capable of inhibiting moisture migration from the fruit pieces;

(b) coating the dried fruit pieces of step (a) with a dry particulate coating of at least one particulate cereal component capable of producing a crunchy texture to the coating, and at least one sweetener;

(c) alternately repeating steps (a) and (b) to form a coated fruit piece with a coating having a predetermined thickness;

(d) cooling the coated fruit pieces thereby forming a coated fruit having a soft moisture migration inhibiting coating with crunchy cereal particulates.

4,961,944

PACKAGE FOR MICROWAVE OVEN COOKING AND METHOD OF USE

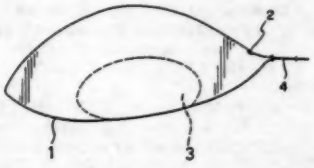
Takeji Matoba, Tokyo, and Masahiro Morita, Uchigotakasakamachi, both of Japan, assignors to Gourmec Laboratory Co., Ltd., Japan

Continuation-in-part of Ser. No. 847,537, Apr. 3, 1986, abandoned. This application Sep. 20, 1988, Ser. No. 246,944

Claims priority, application Japan, Oct. 19, 1985, 60-232309; Jan. 14, 1986, 61-4269

Int. Cl.[5] B65D *81/34*

U.S. Cl. 426—107 **4 Claims**



1. A food receptacle for electronic oven cooking of food, the receptacle being transparent to microwave energy and composed of a heat-resistant synthetic resin impermeable to oil and moisture and having between one to six steam-controlling openings formed in and extending through the thickness of the receptacle, from the inside to the outside, the receptacle being inflatable with increase of the internal pressure induced by the steam generated during heating of the food, up to a predetermined pressure when the steam is vented through said openings, the size of each opening having a diameter of 0.5 to 2.0 mm/300 cc. of receptacle volume, and the number and size of the opening being selected such that the internal pressure in the receptacle is adjustably maintained in a range of about 1.01 to 1.15 atm. and the temperature in the receptacle is adjustably maintained in a range of about 100° to about 105° C. by the steam generated during the electronic oven heating of the food and such that the inflation of the receptacle is observable and provides a visual indication that cooking is complete when the steam has vented through the openings for a predetermined time.

4,961,945

FOOD PRESERVATIVE

Pearson: Bill C., 3513 S. E. 47th St., Oklahoma City, Okla. 73135

Filed Jul. 6, 1987, Ser. No. 69,978

Int. Cl.[5] A23B *4/00, 7/00*

U.S. Cl. 426—269 **8 Claims**

1. A composition for preserving food, consisting essentially of citric acid and alum wherein the ratio of alum to citric acid is at least 2:1.

4,961,946

METHOD OF CRACKING FOR EGG SHELL

Yasuhiro Shimizu, Isehara, Japan, assignor to Toshin Technical Co., Ltd., Kanagawa, Japan

Filed Mar. 13, 1989, Ser. No. 322,741

Claims priority, application Japan, Sep. 7, 1988, 63-224240

Int. Cl.[5] A23J *1/00*

U.S. Cl. 426—299 **3 Claims**

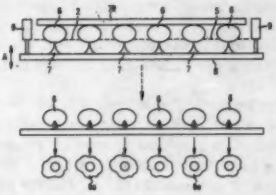
1. A method cracking eggs comprising the steps of:

providing a supporting frame;

placing a plurality of eggs onto the supporting frame, a lower portion of each egg overlying an opening defined by the supporting frame;

providing a cutter underlying the supporting frame;

moving the cutter upwards so as to contact the lower portion of each egg thereby cracking each egg; and



moving the cutter downwardly thereby allowing the yolk and white of each egg to drain downwards through the opening.

4,961,947

METHOD FOR SPLITTING CLOSED SHELL PISTACHIO NUTS

Charleton D. Burlock; Gerald E. Lemmons, and David W. Williams, all of Bakersfield, Calif., assignors to Dole Dried Fruit and Nut Company, Fresno, Calif.

Division of Ser. No. 893,395, Aug. 5, 1986, Pat. No. 4,909,140. This application Jan. 22, 1990, Ser. No. 456,405

Int. Cl.[5] A23P *1/00*

U.S. Cl. 426—482 **6 Claims**

1. A continuous process of treating and splitting closed shell pistachio nuts in a controlled manner comprising:

(a) contacting said closed shell pistachio nuts with water of sufficient quantity and for a sufficient time to saturate the shells of said pistachio nuts to provide a degree of shell flexibility whereby pressure applied to the longitudinal suture of said closed shell pistachio nuts will result in flexure of the shell;

(b) drying the surface of said closed shell pistachio nuts; and

(c) splitting said closed pistachio nuts by positioning said nuts to apply pressure along the longitudinal suture of the shells thereof and then applying pressure to said longitudinal suture whereby the longitudinal suture of said pistachio nut will be cracked and the pressure transmitted to said shell, other than to said longitudinal seam will result in flexure of said shell.

4,961,948

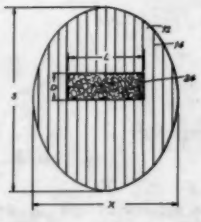
METHOD OF PRODUCING AN EGG ROLL

Dickson L. Hee, 22 Sunset Rd. West, Searington, N.Y. 11507

Division of Ser. No. 186,361, Apr. 25, 1988, abandoned. This application Feb. 22, 1989, Ser. No. 313,998

Int. Cl.[5] A21D *13/00*; A23P *1/00*

U.S. Cl. 426—556 **6 Claims**



1. A method of mechanically assembling of an egg roll simulating a hand rolled egg roll in neatness appearance and delectability by automated machinery, said egg roll being comprised of an edible filler of substantially stable cylindrical

form and a wrapping leaf of a pastry material, said edible filler having an axial length L and a diameter D, characterized by the steps of:

providing a said wrapping leaf having a weight of 14–18 leaves to the pound weight, and of substantially elliptical plan form having a major axis being appreciably greater than the length of said minor axis, and in which the length of said minor axis falls within the range of 1.5 L+2 D and 2 L+2 D.

said wrapping leaf being elliptical in plan form, and, after relaxation of the rolled pastry material, having a major longitudinal axis extending parallel to the grain of the rolled pastry material and constituting the direction of rolling of an egg roll, and having a minor axis constituting the direction of inward folding of the sides of said egg roll;

orienting said wrapping leaf with the direction of said major axis and the direction of said grain extending parallel to the direction of rolling of said egg roll;

placing a cylindrical form of edible filler on said wrapping leaf with a longitudinal axis of said cylindrical form extending substantially parallel to said minor axis and transversely of the direction of said grain of said rolled pastry material;

mechanically folding a first portion of said leaf extending in the direction of said major axis over and around said cylindrical form;

mechanically folding side portions of said leaf upwardly at the ends of said cylindrical form in a direction parallel to said major axis and parallel to the grain of said pastry material, and permitting said side portions to fall inwardly over the partially wrapped said cylindrical form, and, for them to separately drape themselves over said partially wrapped cylindrical form in the absence of any surface contact of said side portions one with the other and in the substantial absence of residual stresses operative to produce outward splaying at said fold lines;

whereby, forces are produced in the respective side portions of said leaf at the lines of folding of each said side portion, said forces cooperating mutually to induce inward movement of said pastry material in advance of cylindrical form of edible filler and prevent outward splaying of said fold lines; and,

mechanically rolling the partially wrapped cylindrical form about the longitudinal axis of said cylindrical form in order to complete the wrapping of said cylindrical form.

4,961,949

METHOD OF PRODUCING A COILED FOOD PRODUCT

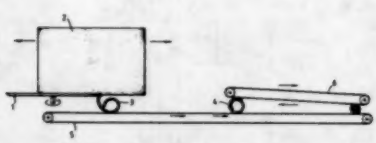
Douglas J. Barnes, Cambridgeshire, and Eduardo Savoni, Northants, both of England, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Filed Dec. 23, 1988, Ser. No. 288,864

Claims priority, application United Kingdom, Dec. 23, 1987, 8730034

Int. Cl.[5] A23P *1/00*

U.S. Cl. 426—518 **10 Claims**



1. A method of manufacturing a coiled food product comprising the steps of:

(a) contacting a body of a brittle food material with a slicing device to form a curled slice, wherein the angle of the slicing device with respect to the surface of the food material is between 10° and 60° and

(b) further curling the curling slice by a curling means to provide the coiled food product.

4,961,950

BUTTER-LIKE COMPOSITION

Salah H. Ahmed, Elk Grove Village, and Anthony J. Luksas, Downers Grove, both of Ill., assignors to Dairy Research, Inc., Rosemont, Ill.

Filed Aug. 30, 1989, Ser. No. 400,399

The portion of the term of this patent subsequent to Sep. 6, 2005, has been disclaimed.

Int. Cl.[5] A23C *15/16;* A23D *7/00*

U.S. Cl. 426—581 **8 Claims**

1. A butter-like composition which has a taste, texture and mouth feel which at least approximates that of butter, comprising a concentrated mixture of (a) at least one water-in-oil emulsion of a liquid dairy product, (b) at least one oil-in-water emulsion of a liquid dairy product, and (c) at least one water-in-oil emulsion of a vegetable fat, wherein the ratio of (a) to (b) is at least about 6:4 but less than 9:1, the ratio of (a) and (b) to (c) is at least 1:3, and the total fat content of the composition is at least about 30%.

4,961,951

POURABLE SHORTENING CONTAINING BUTTER AND METHOD FOR PREPARING

Thomas G. Crosby, Bourbonnais, Ill., assignor to Bunge Foods Corporation, Bradley, Ill.

Continuation-in-part of Ser. No. 216,111, Jul. 7, 1988. This application Mar. 8, 1989, Ser. No. 320,697

The portion of the term of this patent subsequent to Oct. 2, 2007, has been disclaimed.

Int. Cl.[5] A23C *15/12;* A23D *7/00, 9/00*

U.S. Cl. 426—602 **19 Claims**

1. A ready-to-use pourable shortening composition that contains a butter component, the shortening composition comprising:

at least about 70 weight percent, based upon the total weight of the composition, of an edible liquid shortening base component, said edible liquid shortening base component having solids fats index values which are a function of temperature;

in excess of about 1 weight percent, based upon the total weight of the shortening composition, of a butter component, said butter component having solids fat index values which are a function of temperature, wherein the butter component is selected from the group consisting of whole butter, butter substitutes including dairy ingredients, and mixtures thereof; and

the shortening composition having the combination of said edible shortening base component and said butter component has a eutectic characteristic wherein said shortening composition is pourable at ambient, non-refrigeration temperatures as well as at refrigerated temperatures, and wherein said shortening composition has a solids fat index value that is substantially lower than a sum of said respective solids fat index values of said edible shortening base component and of said butter component at a temperature at or below ambient temperature.

4,961,952

DRIED PRODUCT OBTAINED FROM PROCESSING OF SUGAR CANE

Mark H. O'Sullivan, 32 Lambert Road, Indooroopilly, Queensland, Australia

Continuation of Ser. No. 901,271, Aug. 27, 1986, Pat. No. 4,797,297. This application Jun. 24, 1988, Ser. No. 211,230

Claims priority, application Australia, Sep. 2, 1985, PH2229; Sep. 16, 1985, PH2446; Apr. 14, 1986, PH5446; Jun. 26, 1986, PH6562

Int. Cl.[5] A23K *1/00*

U.S. Cl. 426—615 2 Claims

1. A feedstuff for ruminant or monogastric animals consisting essentially of dried non-fibrous parenchyma cells from sugar cane stalks largely freed from fibrous sclerenchyma cells and other structural components of the stalk and of the rind and having deposited on or within the dried parenchyma cell wall a substantial proportion of the dried sugar, and other water soluble components resulting from the evaporation of the contents of natural parenchyma cells, the dried paraenchyma cells being present in powdery form and with at least one feed additive selected from the group consisting of minerals, protein supplements and vitamins.

4,961,953

FAT EMULATING PROTEIN PRODUCTS AND PROCESS

Norman S. Singer, Highland Park, Ill.; Joseph Latella, London, and Yamamoto Shoji, Sherwood, both of Canada, assignors to John Labatt Limited/John Labatt Limitee, London, Canada

Continuation of Ser. No. 127,955, Dec. 2, 1987, which is a continuation-in-part of Ser. No. 606,959, May 4, 1984, Pat. No. 4,734,287. This application Jun. 16, 1989, Ser. No. 367,261

The portion of the term of this patent subsequent to Mar. 29, 2005, has been disclaimed.

Int. Cl.[5] A23J *3/00*

U.S. Cl. 426—656 25 Claims

1. A proteinaceous, water-dispersible, macro-colloid comprising substantially non-aggregated particles of denatured protein having in a dry state a mean diameter particle size distribution ranging from about 0.1 microns to about 2.0 microns, with less than about 2 percent of the total number of particles exceeding 3.0 microns in diameter, and wherein the majority of the said particles are generally spheroidal as viewed at about 800 power magnification under a standard light microscope, the particles in a hydrated state form said macrocolloid having substantially smooth, emulsion-like organoleptic character.

4,961,954

SURFACE MODIFIED SURGICAL INSTRUMENTS, DEVICES, IMPLANTS, CONTACT LENSES AND THE LIKE

Eugene P. Goldberg, Gainesville, Fla.; James W. Burns, Natick, Mass.; G. Sudesh Kumar, Maharastra, India; David C. Osborn, St. Louis, Mo.; Jeffrey A. Larson, Monrovia; John W. Sheets, Clearmont, both of Calif.; Ali Yahiaoui, and Richard Robinson, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Continuation-in-part of Ser. No. 37,153, Apr. 10, 1987, Pat. No. 4,806,382. This application Feb. 1, 1989, Ser. No. 304,479

Int. Cl.[5] A01N *1/02*; B05D *3/06*

U.S. Cl. 427—2 13 Claims

1. In a method for modifying a plastic surface of an article, said surface adapted for contact with living tissue of a human or non-human animal by the gamma-irradiation induced polymerized, chemically grafted coating thereon of a monomer comprising N-vinylpyrrolidone (NVP), 2-hydroxyethylmethacrylate (HEMA) or a mixture of (NVP) and (HEMA) so as to form a thin, hydrophilic coating of (1) poly-N-vinylpyrrolidone (PVP), (2) poly-2-hydroxyethylmethacrylate (PHEMA), or (3) a copolymer of NVP and HEMA [P(NVP-HEMA)] on said surface, the improvement comprising:

conducting said gamma-irradiation induced graft polymerization in an aqueous solution under the following conditions:

(1) monomer concentration in the range of from about 0.5% to about 50%, by weight;

(2) total gamma dose in the range of from about 0.01 to less than about 0.50 Mrad;

(3) gamma dose rate in the range of from about 10 to about 2500 rads/min; and

(4) maintaining the molecular weight of the polymer in solution in the range of from about 250,000 to about 5,000,000.

4,961,955

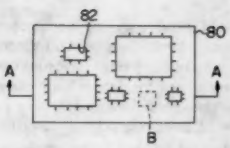
SOLDER PASTE APPLICATOR FOR CIRCUIT BOARDS

Steven R. Goldberg, Sparta, N.J., assignor to ITT Corporation, New York, N.Y.

Filed Dec. 20, 1988, Ser. No. 287,181

Int. Cl.[5] B05D *3/12*

U.S. Cl. 427—57 17 Claims



12. A method of applying solder paste to a printed circuit board comprising the steps of:

filling a reservoir housed in a chamber with a solder paste;

forming a predetermined pattern of holes in a plate;

positioning the plate at one end of the chamber adjacent the reservoir;

affixing slidable leg means to the chamber for positioning the plate a predetermined distance from a surface of the board during the applying operation;

positioning the one end of the chamber on a surface of the board to be soldered; and

applying pressure to the paste to force the paste to extrude through the holes and to deposit on the board to a thickness corresponding substantially to the predetermined distance and in the predetermined pattern.

4,961,956

ELECTROLUMINESCENT LAMPS AND PHOSPHORS

Nicholas T. Simopoulos, and George N. Simopoulos, both of Dayton, Ohio, assignors to Lumel, Inc., Dayton, Ohio

Division of Ser. No. 124,808, Nov. 24, 1987, Pat. No. 4,855,189. This application May 8, 1989, Ser. No. 349,453

Int. Cl.[5] B05D *5/00*

U.S. Cl. 427—70 7 Claims

1. The method of coating electroluminescent phosphor particles with glass, comprising the steps of:

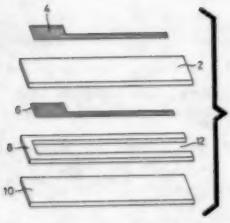
placing a quantity of phosphor particles on the floor of a heating vessel,

heating the phosphor particles to be coated to a temperature of about 490° C., and while so heated subjecting the particles to an atmosphere of SiH_4 and oxygen in a ratio which provides excess oxygen to the reaction causing SiO_2 to form on the surface of the heated phosphor particles, and continuously stirring the particles in said vessel to expose all surfaces of said particles to said atmosphere to form an SiO_2 barrier of uniform thickness in the order of approximately 0.1 to 3.0 microns which fully encapsulates the particles.

4,961,957
METHOD OF PRODUCING AN ELECTROCHEMICAL CELL HAVING A POROUS ELECTRODE OR ELECTRODES

Takayuki Kawae, and Kazuyoshi Shibata, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jul. 31, 1989, Ser. No. 386,607
Claims priority, application Japan, Aug. 3, 1988, 63-194263
Int. Cl.[5] G01N *27/409*
U.S. Cl. 427—125 5 Claims



1. A method of producing an electrochemical cell, said electrochemical cell comprising a solid electrolyte body co-fired with a plurality of electrodes formed on said solid electrolyte body and being used for determining the concentration of a component in the measurement gas, said plurality of electrodes including at least one porous electrode exposed to a measurement gas, said method comprising the steps of:

preparing an unfired electrode material which comprises an inorganic compound that produces a gas at an elevated temperature, a ceramic material consisting essentially of zirconia and an electrically conductive material;

applying said unfired electrode material on an unfired solid electrolyte body to form an electrode layer thereon; and

heating said electrode layer and said unfired solid electrolyte body to a temperature above said elevated temperature to co-fire said electrode layer with said unfired solid electrolyte body, thereby forming said porous electrode on said solid electrolyte body.

4,961,958
PROCESS FOR MAKING DIAMOND, AND DOPED DIAMOND FILMS AT LOW TEMPERATURE

Chandra V. Desphandey, Los Angeles; Rointan F. Bunshah, Playa del Rey, and Hans J. Doerr, Westlake Village, all of Calif., assignors to The Regents of the Univ. of Calif., Oakland, Calif.

Filed Jun. 30, 1989, Ser. No. 374,966
The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.
Int. Cl.[5] C23C *16/00, 16/26, 16/48, 16/50*
U.S. Cl. 427—38 18 Claims

1. A process for depositing a film consisting essentially of diamond on a substrate, said process comprising the steps of:

supporting a substrate in a vacuum;

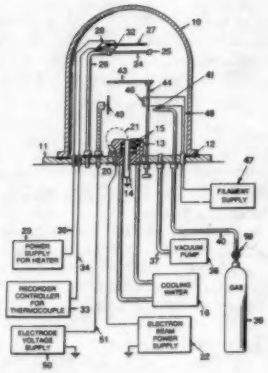
evaporating a source of carbon to produce carbon atoms in a zone between the source of carbon and the substrate;

introducing a hydrogen containing gas into said zone;

accelerating electrons from an electron source into said zone to form a plasma of carbon atoms and hydrogen containing gas, which react to form carbon-hydrogen molecular precursors in said zone;

depositing said precursors from said zone onto said carbon-hydrogen molecular substrate; and

maintaining said substrate at a temperature of between about 20° to 600° C. to dissociate said deposited carbon-hydrogen molecular precursor molecules to form said film consisting essentially of diamond.



4,961,959
QUATERNARY AMMONIUM SALT OF AN ALKOXYSILANE AS A DISPERSANT FOR MAGNETIC PIGMENT

Gary A. Vincent; Judith M. Sylvester, and Harold L. Vincent, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 171,613, Mar. 23, 1988, Pat. No. 4,929,376.
This application Feb. 23, 1990, Ser. No. 484,096
Int. Cl.[5] H01F *10/02*
U.S. Cl. 427—48 15 Claims

1. A process for producing a magnetic recording medium comprising:

(i) mixing a magnetic pigment, a binder for said pigment, a dispersant and an inert organic solvent capable of dissolving said binder, to obtain a uniform dispersion thereof;

(ii) coating said dispersion onto a non-magnetic substrate;

(iii) orienting said treated pigment in a magnetic field; and

(iv) removing said solvent from the coated substrate, said dispersant comprising a quaternary ammonium salt of an alkoxysilane having the formula

$$(RO)_3SiR'\overset{+}{N}R''R'''R'''' \quad X^-$$

wherein R is an alkyl radical having 1 to 4 carbon atoms, R' is an alkylene group of 1 to 4 carbon atoms, R'' and R''' are each alkyl radicals having 1 to 4 carbon atoms, R'''' is an alkyl radical having 8 to 22 carbon atoms and X is a hydrolyzable group selected from chloride, bromide, iodide, acetate, and alkoxide group OR, in which R has been previously defined, or mixtures thereof.

4,961,960
PHOTO-CURABLE COATING COMPOSITIONS

Tamio Iimure, Yawata, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan

Filed Apr. 13, 1984, Ser. No. 600,042
Claims priority, application Japan, Oct. 9, 1981, 56-161784
Int. Cl.[5] C08F *2/50, 226/02*; C08L *63/10, 75/16*
U.S. Cl. 427—54.1 18 Claims

1. A photo-curable coating composition consisting essentially of (a) a photo-curable monomer or polymer having a

plurality of ethylenically unsaturated groups in the molecule, and (b) an adduct of a polyisocyanate compound, an isocyanate group-blocking agent and a photo-polymerizable alcohol having at least one ethylenically unsaturated group; said component (a) being free of free or blocked isocyanate groups; wherein the total number of ethylenically unsaturated groups possessed by said components (a) and (b) is at least 4, said composition being photo-curable by activating radiation and subsequently further curable by heat to form a finished film.

13. A method of forming a protective coating on a surface which comprises the steps of applying the photo-curable coating composition of claim 1 on said surface to form a film, exposing the film to the irradiation of light having a wavelength from 200 to 500 nm for a sufficient length of time to cure the film, and heating the film at a temperature above 100° C. for a period over 10 seconds.

4,961,961

SILICONE WATER BLOCK FOR ELECTRICAL CABLE

Gary A. Vincent, and Daniel F. Meyer, both of Midland County, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 41,558, Apr. 23, 1987, Pat. No. 4,845,309. This application May 9, 1989, Ser. No. 349,732

The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.

Int. Cl.[5] B32B *35/00*

U.S. Cl. 427—140 **24 Claims**

1. A method for restoring in-service electrical distribution cable having a stranded conductor and polyolefin insulation, comprising:

(i) drying the interstices of said conductor,

(ii) exposing the interior of said cable to an anti-treeing additive till said additive is absorbed by the insulation,

(iii) filling the interstices of said stranded conductor with a water block composition comprising

(A) an Si-H endblocked polydiorganosiloxane fluid having a viscosity of 0.5 to about 100 centistokes at 25° C. and represented by the formula $H(R'_2SiO)_xSiR'_2H$ wherein R' is independently selected from the group consisting of alkyl radicals having from 1 to 6 carbon atoms and a phenyl radical and the average value of x is 1 to 40;

(B) a polydiorganosiloxane fluid having a viscosity of 0.5 to about 100 centistokes at 25° C. and represented by the formula

$$G-(SiO)_y-Si-G$$

(R'' R'' / R'' R'')

wherein G denotes an unsaturated radical independently selected from the group consisting of a vinyl group and higher alkenyl radicals represented by the formula $-R'''(CH_2)_mCH=CH_2$, in which R''' is selected from the group consisting of $-(CH_2)_p-$ and $-(CH_2)_qCH=CH-$, m is 1, 2, or 3, p is 3 or 6 and q is 3, 4 or 5, R'' is independently selected from the group consisting of an alkyl radical having 1 to 6 carbon atoms and a phenyl radical and y has average value of 1 to about 40;

(C) a siloxane crosslinker selected from the group consisting of short chain linear siloxanes and cyclic siloxanes, said crosslinker containing functionality selected from the group consisting of Si-H and Si-G functionality, in which G has the above-defined meaning;

(D) sufficient hydrosilation catalyst to cure the mixture of (A), (B), and (C); and

(E) sufficient polymerization inhibitor to allow the cable to be filled with the combination of (A), (B), (C), (D) and (E) before said combination cures to a non-flowing state, and

(iv) curing said water block composition to a non-flowing state.

4,961,962

METHOD AND APPARATUS FOR DISPERSING SPACERS OF A LIQUID-CRYSTAL DISPLAY PANEL

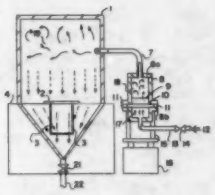
Mitsuki Morimoto, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 28, 1988, Ser. No. 250,320

Claims priority, application Japan, Jan. 21, 1988, 63-11614

Int. Cl.[5] B05C *3/02, 5/00*

U.S. Cl. 427—180 **9 Claims**



5. A method for dispersing spacers over a substrate of a liquid-crystal display panel, comprising

disposing said substrate horizontally in a dispersal box,

blowing said spacers into the dispersal box by means of a gas under controlled pressure and

intermittantly spraying a fixed amount of a mixture of the spacers and said gas, supplied from said spacer feed tank, in the horizontal direction so that the mixture covers the entire region above said substrate in turbulent flow, and

allowing said turbulent flow to subside over a period of time so that said spacers settle and are dispersed evenly on said substrate.

4,961,963

SILICONE RELEASE COATINGS CONTAINING RHODIUM

Yolanda A. Peters, Midland County, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Sep. 1, 1989, Ser. No. 402,392

Int. Cl.[5] B05D *5/10*

U.S. Cl. 427—208.8 **10 Claims**

1. A process for preparing a laminate comprising a substrate and an adhesive releaseably adhered thereto, said process comprising the steps of:

(I) coating a curable silicone release composition on the surface of the substrate;

(II) heating the coated silicone release composition until it is cured to the substrate; and

(III) applying an adhesive to the silicone coating cured to the substrate; wherein the curable silicone release composition consists essentially of

(A) a polydihydrocarbylsiloxane having a Williams Plasticity Number of at least 115 and containing at least two silicon-bonded alkenyl radicals, at least 90 percent of all hydrocarbyl radicals being methyl,

(B) a catalytic amount of a rhodium-containing hydrosilylation catalyst,

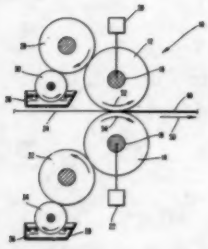
(C) a methylhydrogenpolysiloxane crosslinking agent having an average of at least three silicon-bonded hydrogen atoms per molecule with the hydrogen atoms being bonded to separate silicon atoms, in an amount sufficient to provide from 0.5 to 1.5 silicon-bonded hydrogen atom for every alkenyl radical in the composition, and

(D) a solvent in sufficient amount to provide a viscosity at 25° C. of less than 2 Pa·s for the composition.

4,961,964
METHOD FOR COATING A WEB WITH WET INK THEREON

Harvey W. Dahlgren, Irving, Tex., assignor to Epic Products International Corp., Dallas, Tex.

Division of Ser. No. 066,479, Jun. 26, 1987, Pat. No. 4,836,129.
This application Feb. 22, 1989, Ser. No. 313,733
Int. Cl.[5] B05C 1/08
U.S. Cl. 427—211 7 Claims

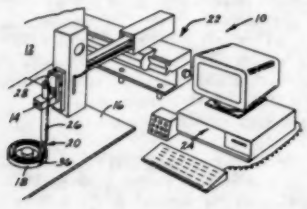


1. A method for sequentially performing one-sided and two-sided coating of webs having wet ink thereon comprising:
supplying coating to a coating applicator roller,
supplying water to a back-up roller forming a couple with said coating applicator roller and having a surface which is hydrophilic and is hard relative to said coating applicator roller,
feeding a web having wet ink thereon between said applicator roller and said back-up roller so that coating is applied to one side of the web and water on the surface of said back-up roller separates the other side of the web from said back-up roller thus preventing ink on the web from contacting said back-up roller,
changing the supply to the back-up roller from water to coating,
supplying coating to the back-up roller, and
feeding web having wet ink thereon between said applicator roller and said back-up roller so that coating is applied to both sides of said web.

4,961,965
METHOD AND APPARATUS FOR AUTOMATED DISPENSING OF LIQUID MATERIALS ONTO A WORKPIECE

Mark P. Dietz, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 29, 1989, Ser. No. 374,098
Int. Cl.[5] B05D 5/10; B05C 3/20
U.S. Cl. 427—286 8 Claims

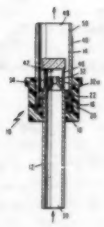


1. Apparatus for automated dispensing of liquid materials onto a workpiece comprising:
a source of liquid materials;
a nozzle assembly including a flexible tube connected to said source of liquid materials and having an outlet end for discharging liquid materials onto a workpiece, said assembly including a spring extending along the length of said tube for biasing said outlet end of said tube toward a predetermined orientation;
a support for holding the workpiece; and
motive power means for moving said assembly relative to said support along a path such that at least a portion of said assembly adjacent said outlet end is in contact with the workpiece as said liquid materials are discharged onto the workpiece.

4,961,966
FLUOROCARBON COATING METHOD

Robert K. Stevens, Raleigh, and Charles Stone, Carrboro, both of N.C., assignors to The United States of America as represented by the Administrator of the Environmental Protection Agency, Washington, D.C.

Filed Feb. 9, 1990, Ser. No. 477,390
Division of Ser. No. 201,242 May 25, 1988, Pat. No. 4,902,318.
Int. Cl.[5] B05D 1/36, 3/02, 7/00
U.S. Cl. 427—299 2 Claims



1. A method for providing a polytetrafluoroethylene coating on a surface, comprising roughing the respective surfaces, coating the roughened surfaces with polytetrafluoroethylene monomers, drying and heating the resulting coating to a temperature of about 250° C. followed by cooling, and coating the resulting surfaces with fluorinated ethylene-propylene monomers followed by heating to a temperature of about 350° C. to effect polymerization and crosslinking.

4,961,967
PRIMER COMPOSITIONS

Edwin P. Pluddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Aug. 8, 1988, Ser. No. 229,666
Int. Cl.[5] B05D 3/06; C08K 5/15
U.S. Cl. 427—302 23 Claims

1. A primer composition comprising:
(A) from about 1 to 25 parts by weight of an organosilicon compound selected from the group consisting of 3-glycidoxypropyltrimethoxysilane, 3-mercaptopropyltrimethoxysilane, 2-mercaptoethyltrimethoxysilane, 2-(3,4-epoxycyclohexyl)-ethyltrimethoxysilane and partial hydrolyzate thereof;
(B) from about 99 to 75 parts by weight of an alkoxymethyltriazine which is a product of etherification of a methyloltriazine with a monohydric alcohol having fewer than 5 carbons; and
(C) a difunctional aromatic compound selected from the group consisting of 1,4-diaminobenzene, resorcinol, salicylic acid, hydroquinone, 4-hydroxybenzoic acid and isomers of aminobenzoic acid, said difunctional aromatic compound constituting from about 10 to 50 parts by weight for each 100 parts by weight of said organosilicon compound (A) and said alkoxymethyltriazine (B) in said composition.

9. In a method of coating a solid substrate with a primer

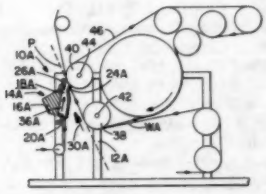
composition to promote adhesion of a polymer to said substrate, the improvement comprising using as said primer the composition of claim 1.

4,961,968

SHORT DWELL COATER APPARATUS WITH BACKING BLANKET DISPOSED BETWEEN BLADE AND GUIDE ROLL

Jay Shands, Beloit, Wis.; John Schamell, Roscoe, Ill.; Gerald Garde, and Robert Carlson, both of Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Filed Mar. 28, 1989, Ser. No. 329,618
Int. Cl.[5] B05D *3/12*
U.S. Cl. 427—356 7 Claims



7. A method for applying a primary flow of coating material to a moving web of paper, said method comprising the steps of:

rotatably supporting a first and second guide roll such that the axis of rotation of the first and the second guide rolls are disposed spaced parallel relative to each other;

moving a backing blanket around the guide rolls such that the blanket defines an endless loop for supporting the web of paper during movement of the web of paper from the first to the second roll;

applying the primary roll of coating material to the web moving between the first and the second guide rolls, the primary flow of coating material being applied through a coater outlet of a short dwell coater disposed adjacent to the web and between the guide rolls, the arrangement being such that the web supported by the blanket moves in a plane disposed tangentially relative to the guide rolls so that secondary flows of coating material within the coater are inhibited; and

urging a resilient blade disposed downstream relative to the outlet and adjacent to the second guide roll towards the second guide roll so that the blade is fully supported by the second guide roll, thereby inhibiting secondary flows of coating material within the coater.

4,961,969

PROCESS FOR RECOVERING MICROBIALLY PRODUCED INTERFERON-β

Susan Hershenson, San Francisco; Ze'ev Shaked, Berkeley, and Jody Thomson, Albany, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Filed May 11, 1987, Ser. No. 48,686
Int. Cl.[5] C12P *21/00*; A61K *45/02*; C07K *15/26*
U.S. Cl. 435—69.51 21 Claims

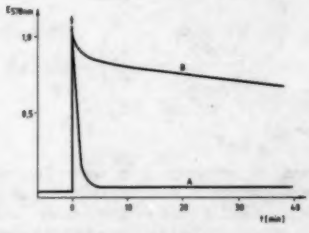
1. In a process for recovering purified, biologically active, bacterially produced IFN-β, wherein the bacterially produced IFN-β is separated from the bulk of cellular components of the bacteria, solubilized in a reduced form and thereafter disposed in a chaotropic environment, oxidized, and thereafter purified, the improvement comprising renaturing the oxidized IFN-β by removing the chaotropic environment in the presence of a stabilizing additive in an amount effective to maintain the solubility of the oxidized IFN-β, wherein oxidized IFN-β precipitates during removal of the chaotropic environment in the absence of said stabilizing additive, and thereafter purifying the oxidized, soluble IFN-β.

4,961,970

METHOD FOR DETERMINING IRON IN A BODY FLUID SAMPLE

Joachim Siedel, Bernried; Lieselotte Schellong, Tutzing; Johnny Staepels, Seefeld; Uwe Herrmann, Bernried, and Michael-Harold Town, Oberhausen, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Aug. 30, 1988, Ser. No. 238,620
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1987, 3729502
Int. Cl.[5] G01N *33/20*
U.S. Cl. 436—84 15 Claims



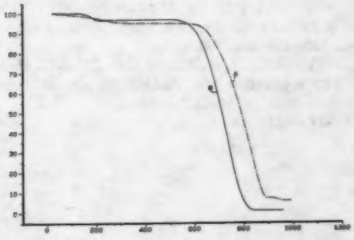
1. Method for determining iron in a body fluid sample comprising adding to a body fluid sample a fatty acid polyethylene glycol ester, an alkanol polyglycol ether, guanidine hydrochloride in a concentration of at least 1 mole/liter of sample to liberate said iron, reducing said iron to Fe^{2+}, adding a color forming reagent which forms a photometrically evaluatable complex with Fe^{2+}, and photometrically measuring said complex as a measure of iron in said sample.

4,961,971

METHOD OF MAKING OXIDATIVELY STABLE WATER SOLUBLE AMORPHOUS HYDRATED METAL OXIDE SIZED FIBERS

Roscoe A. Pike, Granby, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1988, Ser. No. 285,922
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—376.2 8 Claims



1. A method of making a fiber reinforced polymeric matrix composite material wherein the fiber reinforcement has a layer thereon formed by

(a) reacting aluminum, titanium, silicon, or zirconium with HBr or HI;

(b) oxidizing the reaction product with a water soluble oxidizing agent to form a hydrosol and reduce the anion concentration; and

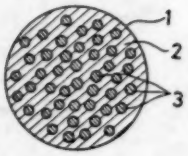
(c) applying said hydrosol to said fiber surface.

4,961,972

PROCESS FOR PRODUCING LINEAR MATERIAL

Goro Shimizu, Ohtsu; Masayasu Kamada, Kusatsu, and Yoshimi Hayashi, Kyoto, all of Japan, assignors to Matsui Shikiso Chemical Co., Ltd., Kyoto, Japan, a part interest

Filed Feb. 25, 1987, Ser. No. 18,599
Claims priority, application Japan, Mar. 1, 1986, 61-45114
The portion of the term of this patent subsequent to Jan. 9, 2007, has been disclaimed.
Int. Cl.[5] B05D 3/02
U.S. Cl. 427—388.1 6 Claims



1. A process for producing a linear material characterized by applying onto a core in the form of a monofilament or multifilament, a vinyl chloride resin sol composition having a thermochromic particulate material incorporated therein,

the thermochromic particulate material being prepared by enclosing with (1) a high polymer compound in the form of a thermosetting resin, an electron-donating chromogenic substance, an electron-accepting substance for the chromogenic substance and a solvent having a boiling point of at least 150° C. and selected from the group consisting of alcohols, amides, esters and azomethines, and further covering the resulting product with (2) a different high polymer compound in the form of a hydrophilic high polymer compound, whereby to provide the particulate material as a double film of an inner thermosetting resin layer and an outer hydrophilic high polymer compound layer encapsulating said electron-donating chromogenic substance, said electron-accepting substance and said solvent, therewithin, and

heating the core onto which said sol composition has been applied to gel the sol composition and cover the core with the gelled composition.

4,961,973

ARTICLES WITH SLIP RESISTANT SURFACES AND METHOD OF MAKING SAME

William S. Molnar, Birmingham, Mich., assignor to W. S. Molnar Co., Birmingham, Mich.

Continuation of Ser. No. 110,950, Oct. 20, 1987, abandoned.
This application Mar. 8, 1989, Ser. No. 320,904
Int. Cl.[5] B05D 1/10
U.S. Cl. 427—423 36 Claims

1. A process for forming an adherent rough coating on a receiving surface of an article to provide a slip resistant surface for persons walking or working thereon comprising the steps of:

providing a hollow wire filled with fill materials including iron and alloying elements with iron,

said hollow wire being constructed from iron,

thermally acting on said hollow wire and said materials to heat said iron to its alloying temperature to provide molten metal droplets forming an iron alloy including at least some of said fill materials,

directing said molten metal droplets as a spray against said receiving surface to form an adherent rough coating defining a slip resistant surface for persons walking or working thereon,

said slip resistant surface of said iron alloy having a hardness of between around 40 Rc to around 65 Rc.

4,961,974

LAMINATED FILTERS

Roger L. Jones, Signal Mountain, Tenn., assignor to Ahlstrom Filtration, Inc., Chatanooga, Tenn.

Filed Mar. 3, 1989, Ser. No. 321,037
Int. Cl.[5] B01D 39/16, 39/18; B32B 5/24, 5/26
U.S. Cl. 428—34.2 20 Claims

1. A laminated composite structure for use in making fluid filters comprising:

(a) a densified high loft layer of powder bonded nonwoven fabric, rebulkable by heating, bonded to

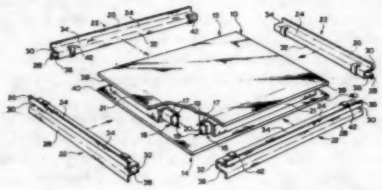
(b) a filter media that supplies stiffness and filtration efficiency to the laminate and to finished fluid filters prepared therefrom.

4,961,975

SEALED GLASS UNIT

Walter Bejnar, 332 Oxbow Crescent, Ontario, Mississauga, Ontario, Canada (L4Z 2S3)

Filed Nov. 14, 1988, Ser. No. 270,593
Int. Cl.[5] E06B 5/00
U.S. Cl. 428—34 6 Claims



1. A sealed glass unit comprising a pair of spaced glass window panes and a sealing frame assembly between the glass panes and extending therearound adjacent edges thereof to maintain the glass panes in sealed spaced parallel relationship,

said sealing frame assembly comprising elongated spacer means extending around and between the glass panes in laterally inwardly spaced relationship from their edges to maintain the glass panes in said spaced parallel relationship,

elongated connector means extending longitudinally at least partway around the glass panes, said elongated connector means comprising elongated body means extending laterally between the glass panes in spaced relationship thereto from a first location aligned with the edges thereof to a second location spaced from the spacer means, and said elongated connector means also having opposed connector flanges extending in opposite directions from the body means and extending at least partway across said glass pane edges in spaced relationship thereto, and

structural sealant compound fully occupying the spaces between the elongated connector body means and the glass panes, between the elongated connector body means

and the elongated spacer means and between the connector flanges and the glass pane edges.

4,961,976

METHOD OF INCREASING THE DYNAMICAL STRENGTH OF GLASS CONTAINER

Yutaka Hashimoto, Sakai; Masanobu Yumoto, Izumi-ohtsu; Toshihiko Umaba, Takaishi; Yutaka Kamada; Tsutomu Matsubara, both of Nishinomiya, and Sigeo Kawaguchi, Osaka, all of Japan, assignors to Dainippon Ink & Chemicals, Inc., Tokyo and Yamamura Glass Co., Ltd., Hyogo, both of, Japan

Continuation of Ser. No. 187,365, Apr. 28, 1988, Pat. No. 4,891,241. This application Sep. 20, 1989, Ser. No. 409,793
Claims priority, application Japan, Apr. 28, 1987, 62-103074
Int. Cl.[5] B65D *25/34;* B32B *27/10*
U.S. Cl. 428—34.6 16 Claims

1. A glass container having an increased pressure-resistant strength and impact strength which is produced by the method consisting essentially of treating the surface of the glass container with a silane coupling agent, applying a coating material consisting essentially of a reactive compound having at least two (meth)acryloyl groups in the molecule to the treated glass container, and subjecting it to irradiation of an activated energy ray to cure the coating material applied.

4,961,977

COMPOSITE ARTICLE

Joel Archer, Briec, and Denis Van Wassenhove, Crepy-en-Valois, both of France, assignors to Textilver, S.A., Crepy-en-Valois, France

Filed May 17, 1988, Ser. No. 194,802
Claims priority, application United Kingdom, May 18, 1987, 87-11644
Int. Cl.[5] F16L *11/02*
U.S. Cl. 428—36.3 6 Claims

1. A composite article comprising continuous, interlaced reinforcing fibers individually coated with an inner support layer of thermoplastic polymeric support material, said coated interlaced reinforcing fibers being embedded within an outer layer of softenable polymeric matrix material, said thermoplastic support material having a softening point which is at least 10° C. higher than that of the matrix material, said interlaced reinforcing fibers being oriented relatively to one another to undergo trellis deformation by shear slipping when the article is deformed and being subject to such trellis deformation by shear slipping when the article is deformed when the polymeric matrix material is in a softened condition and the support layer is unsoftened, the unsoftened support layer providing transverse support for the fibers, thus reducing the tendency of the fibers to kink.

4,961,978

NOVEL CLOSURE DEVICE FOR SHRINKWRAPS

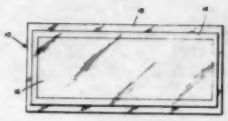
Anthony J. Doheny, Jr., Natick, and James R. Noonan, Watertown, both of Mass., assignors to The Kendall Company, Boston, Mass.

Filed Mar. 6, 1989, Ser. No. 318,863
Int. Cl.[5] B32B *3/08, 7/06*
U.S. Cl. 428—40 9 Claims

1. A closure device comprising:

(a) a high temperature-resistant, flame-resistant and dimensionally stable backing layer;

(b) a crosslinked, high temperature-resistant, shear-resistant, and flame-resistant pressure sensitive adhesive applied to one surface of said backing layer; and



(c) a heat-shrinkable film dimensionally smaller than said pressure sensitive adhesive layer applied to said pressure sensitive adhesive layer so as to remain a peripheral area of exposed pressure sensitive adhesive.

4,961,979

OPTICAL RECORDING MEDIUM

Atsuko Iida, Yokohama; Hiroi Ohdaira, Chigasaki; Masaki Katsura, Yokosuka; Reiji Nishikawa, Yokohama, and Norio Ozawa, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 5, 1989, Ser. No. 333,268
Claims priority, application Japan, Apr. 5, 1988, 63-83808; Aug. 23, 1988, 63-208603
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—64 13 Claims

1. An optical recording medium, comprising:

a transparent substrate having a tracking line formed therein; and

a recording layer consisting essentially of a low oxide of nickel represented by the general formula NiO_x where x falls within the range of between 0.5 and 0.8; and

formed on that surface of the substrate in which is formed the tracking line.

4,961,980

PROCESS AND APPARATUS FOR THE MANUFACTURE OF FLOOR OR WALL COVERINGS INCORPORATING PEBBLES, AND THE PRODUCT OBTAINED THEREFROM

Gerard Valenduc, L-Wiltz, Luxembourg, assignor to Eurofloor, S.A., Luxembourg

Division of Ser. No. 69,369, Jul. 1, 1987, Pat. No. 4,882,205. This application Jul. 10, 1989, Ser. No. 364,811
Claims priority, application Luxembourg, Jul. 8, 1986, 86504
Int. Cl.[5] B05D *1/36*
U.S. Cl. 428—67 11 Claims

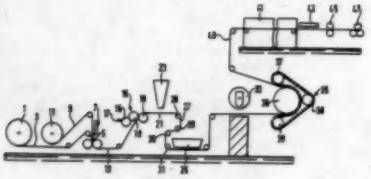
1. Synthetic covering product obtained from the process comprising the steps of:

depositing a layer of plastisol onto a substrate;

depositing a plurality of discrete particles into said plastisol layer;

depositing a powder containing fusible particles compatible with said plastisol coated substrate and said discrete particles, said powder being deposited onto said discrete parti-

cles and plastisol layer in an amount effective to provide a smooth outer surface to the synthetic covering product upon the melting of said fusible particles and said powder being deposited by powder deposition means wherein no



contact occurs between said powder deposition means and said substrate or said deposited layers; and

heating said powder material to melt said fusible particles and thereby provide a smooth outer surface to the synthetic covering product.

4,961,981

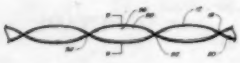
WEIGHTED NETTING

Patrick K. Keegan, P.O. Box 441522, Houston, Tex. 77244-1522

Filed Mar. 13, 1989, Ser. No. 322,691

Int. Cl.[5] B32B *3/12*

U.S. Cl. 428—72 **18 Claims**



1. A cover article comprising:

a plurality of compartmentalized members connected together so as to form a geometric shape;

a netting connected to said plurality of compartmentalized members across the interior of said geometric shape, said netting having a cross-hatched configuration, each of the cross-hatches of said configuration having a size suitable for preventing insects from passing therethrough and a size suitable for enabling visual observation therethrough; and

a plurality of weighted elements contained within said compartmentalized members.

4,961,982

LIQUID-ABSORBING PAD ASSEMBLY AND METHOD OF MAKING SAME

Jeffrey L. Taylor, Cincinnati, Ohio, assignor to Standard Textile Company, Inc., Cincinnati, Ohio

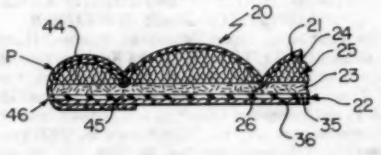
Continuation of Ser. No. 253,667, Oct. 5, 1988, abandoned, which is a continuation of Ser. No. 139,185, Dec. 29, 1987, abandoned, which is a continuation of Ser. No. 911,974, Sep. 25, 1986, abandoned. This application Mar. 15, 1989, Ser. No. 323,765

Int. Cl.[5] B32B *33/00*

U.S. Cl. 428—41 **34 Claims**

1. In a liquid-absorbing pad assembly having a peripheral outline and comprising, a top layer, a bottom waterproof layer, and an absorbent layer between said top and bottom layers, the improvement comprising, a multiple-purpose structure disposed between said absorbent layer and said top layer, said structure providing cushioning, means enabling immediate passage therethrough of liquid from said top layer, means substantially preventing reverse wicking of liquid that has passed through said structure, and a suspension which allows air to freely associate with the underside of said top layer for drying purposes,

characterized in that



said structure is a resilient sheet of foamed synthetic plastic material having a reticulated construction.

4,961,983

PRINTABLE PAPER SUBSTITUTE BASED ON SPUNBONDED POLYPROPYLENE FABRICS

Ronald L. Smorada, and George W. Logan, both of Kennett Square, Pa., assignors to Reemay, Inc., Old Hickory, Tenn.

Filed Dec. 5, 1988, Ser. No. 280,031

Int. Cl.[5] B32B *3/04*

U.S. Cl. 428—121 **10 Claims**

1. A synthetic paper substitute capable of being processed into envelopes and the like, said paper substitute comprising a substrate of nonwoven spunbonded polypropylene fabric having a basis weight of less than 2.5 oz. per square yard, and a continuous outer impermeable polymeric film layer bonded to both sides of said substrate, at least one of said layers comprising polypropylene and sufficient pigment to render said layer substantially opaque, the surface of said one layer being partially oxidized and receptive to printing.

4,961,984

TAB FILM TAPE CARRIER

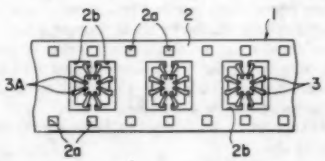
Yasushi Takeda, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 30, 1989, Ser. No. 373,581

Claims priority, application Japan, Jun. 30, 1988, 63-163561

Int. Cl.[5] B32B *23/02*

U.S. Cl. 428—192 **1 Claim**



1. A TAB film tape carrier, comprising a substrate and copper foil wiring on the substrate having a predetermined lead form patterned by laminating and etching, the copper foil wiring being made of rolling copper recrystallized by annealing treatment, wherein the annealing treatment comprises heating the copper foil at about 180°–280° C., maintaining the copper foil at that temperature for about one hour and then cooling the heated copper foil slowly so that the elongation of

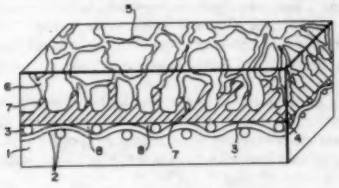
the copper foil is about 20% and the Vickers hardness of the copper foil is about 20 to 35 Hv.

4,961,985

FABRICS FOR PROTECTIVE CLOTHING

Robert L. Henn; Dilip J. Sakhpara, both of Newark, Del.; Christian E. Bailey, Port Deposit, Md.; John J. Bowser, Newark, Del., and Peter L. Brown, Elkton, Md., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Jul. 6, 1988, Ser. No. 215,669
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—196 **34 Claims**



1. A coated fabric consisting essentially of:

(a) a substrate fabric having a moisture vapor transmission rate of at least 5000 gm/m^2/24 hrs; and;

(b) a continuous coating on at least one side of said fabric comprising a polymeric, porous, scaffold material having a microstructure of open interconnected voids wherein the void volume of the scaffold material is at least 65% of the total scaffold material volume,

said scaffold having a weight of between 1 and 10 grams per square meter;

said scaffold having a layer of hydrophilic, polyurethane resin on one surface of the scaffold, which extends into a portion of the voids of the scaffold; said polyurethane layer having a weight of between 5 and 25 gm square meters;

said article being a microorganism barrier such that it does not permit passage of viruses when challenged by the Virus Barrier Efficiency Test at 4 psig; and said article being an airborne particulate barrier such that is exhibits an air permeability less than 6 cc per minute;

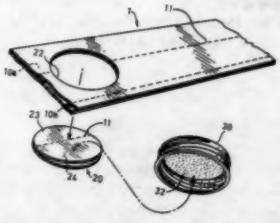
said fabric and coating arranged so that the polyurethane resin on the coating is adjacent the fabric.

4,961,986

SEALING MEMBER FOR A CONTAINER

Michael P. Galda, Acton, and Stephen H. Witt, Smithville, both of Canada, assignors to Stanpac Inc., Smithville, Canada

Filed Mar. 2, 1988, Ser. No. 162,787
Claims priority, application Canada, Sep. 9, 1987, 546450
Int. Cl.[5] B32B *7/06, 7/10, 7/14*
U.S. Cl. 428—201 **35 Claims**



1. A sealing member adapted for securing to a lip around an opening of a container to close the container, the sealing member comprising: a membrane having a periphery, one side of which is for bonding to the lip of a container; a first sheet; a first layer of adhesive between the membrane and the first sheet bonding facing portions of the membrane and the first sheet together to form a composite portion, whilst leaving at least one portion of the first sheet free in a separated portion of the sealing member, the free portion of the first sheet forming a tab, wherein a part of the periphery of the first sheet forming a tab, wherein a part of the periphery of the membrane bounding that portion of the membrane forming the composite portion is common with a corresponding part of the periphery of the first sheet; and an additional layer of adhesive on said one side of the membrane which is adapted for bonding to the lip of the container, with the first layer of adhesive bonding the first sheet and the membrane together so strongly that, in use, the first sheet and the membrane can be removed as a unit from the lip of the container to open the container.

4,961,987

ALUMINUM NITRIDE SINTERED BODY WITH HIGH THERMAL CONDUCTIVITY AND PROCESS FOR PRODUCING SAME

Akiyasu Okuno, Kani; Masakazu Watanabe, Nagoya, and Kazuhiko Ikoma, Komaki, all of Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Division of Ser. No. 39,347, Apr. 17, 1987, Pat. No. 4,877,760, which is a continuation-in-part of Ser. No. 864,897, May 20, 1986, abandoned. This application Sep. 11, 1989, Ser. No. 405,872
Claims priority, application Japan, May 22, 1985, 60-111113; May 24, 1985, 60-112330
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—209 **2 Claims**

1. A multilayer circuit board comprising at least two layers of an insulating substrate,

said insulating substrate comprising an aluminum nitride-base sintered body with high thermal conductivity, excellent wettability to metal and a specific resistivity of at least 10^9 ohm-cm which consists essentially of 100 parts by weight of aluminum nitride and 0.1–10 parts by weight of at least one component selected from the group consisting of metal borides of elements of Groups 4a (Ti, Zr, Hf), 5a (V, Nb, Ta) and 6a (Cr, Mo, W) of the International Periodic Table, and metal nitrides of elements of said Groups 4a and 5a of the International Periodic Table, based on the weight of metal of said at least one component.

4,961,988

GENERAL PACKING OF EXPANDED GRAPHITE

Di Xiang Zhu, Zhejiang, China, assignor to Zhejiang CI XI Seal Material Factory, Zhejiang, China

Filed Sep. 27, 1988, Ser. No. 249,981
Claims priority, application China, Sep. 28, 1987, 87106668
Int. Cl.[5] D03D *3/00*
U.S. Cl. 428—229 **22 Claims**

1. A general packing of expanded graphite comprising mainly the vermiform laminae of expanded graphite and auxiliary materials characterized by the embedment of said auxiliary material which has previously been impregnated or coated with an organic adhesive into the vermiform graphite laminae, and bonding them to each other with said organic adhesive.

4,961,989

FIRE-RESISTING MATERIAL

David A. Grimwood, Longlevens, Great Britain, assignor to Insumat Limited, London, England

Continuation of Ser. No. 361,695, Jun. 1, 1989, abandoned, which is a continuation of Ser. No. 30,238, Mar. 26, 1987, abandoned. This application Feb. 20, 1990, Ser. No. 483,972

Claims priority, application United Kingdom, Mar. 27, 1986, 8607804

Int. Cl.[5] B32B *19/02, 25/20, 31/20, 33/00*

U.S. Cl. 428—229 11 Claims

1. A flame resistant material, comprising:

a coherent flexible sheet capable of nondestructive flame resistance for at least approximately fifteen minutes at 1100° C. said sheet including a flexible layer of refractory ceramic fibers fully impregnated by and totally encapsulated within a fire resistant silicone rubber compound.

4,961,990

FIBROUS MATERIAL FOR COMPOSITE MATERIALS, FIBER-REINFORCED COMPOSITE MATERIALS PRODUCED THEREFROM, AND PROCESS FOR PRODUCING SAME

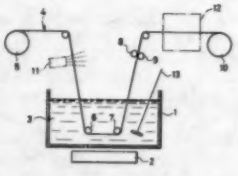
Senichi Yamada; Shinichi Towata; Hajime Ikuno, all of Aichi; Takemi Yamamura, Yamaguchi; Toshihiro Ishikawa, Yamaguchi, and Masaki Shibuya, Yamaguchi, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho and Ube Industries, Ltd., both of, Japan

Filed Jun. 15, 1987, Ser. No. 61,548

Claims priority, application Japan, Jun. 17, 1986, 61-139297; Mar. 11, 1987, 62-55823; Apr. 6, 1987, 62-84324; Apr. 20, 1987, 62-96889; Apr. 24, 1987, 62-101277

Int. Cl.[5] B32B *5/16*

U.S. Cl. 428—240 14 Claims



1. A fibrous material for a composite material comprising a bundle of continuous fibers or a woven fabric comprising a plurality of said bundles of continuous fibers, said continuous fibers comprising at least one material selected from the group consisting of a ceramic, carbon and a metal, in which fine particles, and at least one of short fibers and whiskers each comprising at least one heat resistant material selected from the group consisting of a ceramic, carbon and a metal, are contacted with the surface of said continuous fibers.

4,961,991

FLEXIBLE GRAPHITE LAMINATE

Ronald A. Howard, Brook Park, Ohio, assignor to Ucar Carbon Technology Corporation, Danbury, Conn.

Filed Jan. 29, 1990, Ser. No. 471,531

Int. Cl.[5] B32B *31/06*

U.S. Cl. 428—246 10 Claims

1. A flexible graphite laminate comprising a polymer resin coated cloth disposed and bonded between two sheets of flexible graphite material.

4,961,992

LAMINATED PACKAGING FILM

Ricardo Balloni, Fairport, and A. Michael Nahmias, Victor, both of N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jan. 13, 1989, Ser. No. 296,639

Int. Cl.[5] B32B *5/16*

U.S. Cl. 428—332 30 Claims

1. A method for manufacturing a polymer film laminate comprising:

providing a first polyolefin web, said first web including a core layer (b) and an upper surface layer (a) coextensively adherent to the upper surface of said core layer (b) and containing an anti-blocking effective amount of anti-blocking agent and a coefficient of friction-reducing amount of silicone oil;

providing a second polyolefin web, said second web including a lower surface layer (a^1), said lower surface layer (a^1) containing an anti-blocking effective amount of anti-blocking agent but being substantially devoid of silicone oil;

applying an adhesive between said first and second webs;

bonding said first web to said second web such that said silicone oil-containing upper surface layer (a) of said first web and said lower surface layer (a^1) of said second web remain exposed; and

contacting said silicone oil-containing upper surface layer of said first web with said lower surface layer (a^1) of said second web, thereby transferring a coefficient of friction-reducing amount of silicone oil to said lower surface layer (a^1) of said second web.

4,961,993

ETHYLENE VINYL ACETATE-DIOCTYL MALEATE-2-ETHYLHEXYL ACRYLATE INTERPOLYMERS

Paul R. Mudge, Belle Mead, N.J., assignor to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Division of Ser. No. 169,632, Mar. 17, 1988, Pat. No. 4,908,268. This application Dec. 15, 1989, Ser. No. 450,951

Int. Cl.[5] C08F *20/10*; C09J *7/02*

U.S. Cl. 428—343 14 Claims

1. A process for the production of pressure sensitive adhesive compositions comprising polymerizing, using semi-batch emulsion polymerization techniques, an interpolymer comprising 25 to 40% by weight of a vinyl ester of an alkanoic acid; 10 to 30% by weight ethylene; 20 to 30% by weight of di-2-ethylhexyl maleate or fumarate; 20 to 30% by weight of 2-ethylhexyl acrylate and 1 to 5% by weight of a monocarboxylic acid wherein all the ethylene and vinyl ester are charged initially together with 50 to 75% of the maleate or fumarate and the remaining maleate or fumarate is added incrementally over the course of the polymerization with the acrylate and monocarboxylic acid monomer.

4,961,994

PROTECTIVE COATED COMPOSITE MATERIAL

Frank E. Cariou, Cherry Hill, N.J., and Theodore A. Harris, Jr., Philadelphia, Pa., assignors to General Electric Company, King of Prussia, Pa.

Filed Dec. 16, 1987, Ser. No. 133,774

Int. Cl.[5] B32B *9/00*

U.S. Cl. 428—408 2 Claims

1. A protective coated composite material consisting essentially of:

a graphite-epoxy composite material or a composite material containing graphite fibers,
a poly-para-xylylene waterproofing layer over said composite material,
a metal oxide layer over said waterproofing layer,
a third layer of a reflecting metal over said metal oxide layer, and
a second metal oxide layer over said third layer.

4,961,995

POLISHABLE, FLAME RETARDED, SYNTHETIC MINERAL PRODUCT

Gilbert B. Ross, 12836 Arroyo, Sylmar, Calif. 91342, and Lonnie F. Risley, 48371 Twin Pines Ranch Rd., Idyllwild, Calif. 92324

Continuation of Ser. No. 83,716, Aug. 10, 1987, abandoned. This application Aug. 4, 1989, Ser. No. 389,741
Int. Cl.[5] B32B *17/00*; C09K *21/00*; C08K *3/10*; A47G *35/00*
U.S. Cl. 428—409 27 Claims

19. A polishable, flame retarded, hard surface architectural article comprising a synthetic organic resin matrix and a flame retarding effective amount of flame retardant and resin, whereby said flame retardant is added into said matrix, as particles having a coating of said resin , said coating being separately formed from said matrix by curing said particle-coating resin outside of said matrix, and thereafter adding said particles into said matrix, said resin coating said flame retardant particles against polish-interfering exposure of said particles within said matrix, said resin coating having like polishing characteristics to said matrix, whereby said article has a uniformly polishable surface.

4,961,996

NON-STICK COATINGS ON GLASS

Alain R. E. Carre, Le Chatelet en Brie, and Francoise M. M. Roger, Avon, both of France, assignors to Corning Incorporated, Corning, N.Y.

Filed Dec. 22, 1988, Ser. No. 288,689
Claims priority, application France, Jan. 5, 1988, 88 00025
Int. Cl.[5] B32B *17/10, 27/08*
U.S. Cl. 428—421 4 Claims

1. A coated article comprising:
a glass or glass-ceramic substrate
a polyamide-imide film bonded to at least a portion of said substrate, the film being a reaction product of an organosilane and a polyamide-imide prepolymer; and
a non-stick polymer layer bonded to at least a portion of said film, the non-stick polymer layer being formed of a material selected from the group consisting of silicone and fluorocarbon polymers.

4,961,997

THERMAL TRANSFER RECORDING MEDIUM

Masao Asano; Yumi Matsuzawa; Mutsumi Sekimoto; Kunihiro Koshizuka; Toshiaki Tezuka, and Takao Abe, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Feb. 25, 1988, Ser. No. 160,174
Claims priority, application Japan, Mar. 2, 1987, 62-47254; Sep. 3, 1987, 62-220818
Int. Cl.[5] B41M *5/26*
U.S. Cl. 428—423.1 6 Claims

1. A thermal transfer recording medium having a thermal transfer colorant layer provided on one surface of a support and a backing layer provided on other surface of the support, wherein the improvement comprises said backing layer containing a cured product of a mixture of a silicone-modified polyurethane resin and a heat-resistant organic powder.

4,961,998

DIELECTRIC COMPOSITION HAVING CONTROLLED THERMAL EXPANSION

Robert E. Senkalski, and Donald L. Hasenmayer, both of North Wales, Pa., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 248,766, Sep. 23, 1988, abandoned. This application Feb. 10, 1989, Ser. No. 309,517
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—426 20 Claims

1. A dielectric composition, suitable for casting or laminating onto a ceramic substrate, comprising in combination (a) about 20–65% by weight of a refractory filler, (b) about 10–30% by weight of an organic binder and (c) about 25–60% by weight of a mixture of (i) at least one non-crystalline glass having a coefficient of thermal expansion less than the coefficient of thermal expansion of said substrate and (ii) at least one non-crystalline glass having a coefficient of thermal expansion greater than the coefficient of thermal expansion of said substrate.

4,961,999

THERMISTOR COMPOSITION

Jacob Hormadaly, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 222,495, Jul. 21, 1988, Pat. No. 4,906,406. This application Sep. 5, 1989, Ser. No. 388,951
Int. Cl.[5] B32B *9/00*; H01B *1/08*
U.S. Cl. 428—427 2 Claims

1. A thermistor comprising a layer of a composition consisting essentially of an admixture of finely divided particles of (a) 5–60% wt. of a ruthenium-based pyrochlore; (b) 95–40% wt. of a borosilicate glass or mixture of glasses containing by mole %, basis total glass, (1) 65–85% glass-forming oxides containing 25–55% B_2O_3, 40–10% SiO_2 and 30–0% other glass-forming oxides selected from Al_2O_3, Bi_2O_3, ZrO_2 and mixtures thereof, and (2) 35–15% glass modifying oxides consisting essentially of 3–35% alkaline earth metal oxide(s) of which no more than about 10% is MgO and 0–28% replacement oxide(s) selected from the group consisting of CuO, Cu_2O, PbO, ZnO and mixtures thereof, of which none exceeds 10% and the total of which does not exceed 80% of the total glass modifying oxides, the viscosity of the glass upon firing at a peak temperature of 700°–1000° C. being from 10 to 10,000 poises, both of components (a) and (b) being dispersed in (c) an organic medium, which layer has been printed upon a substrate and fired to effect volatilization of the organic medium therefrom and liquid phase sintering of the glass.

4,962,000

MICROWAVE ABSORBING COMPOSITE

Jeffrey O. Emslander, Oakdale, Minn.; Curtis L. Larson, Hudson, Wis., and Pierre H. Lepere, Cottage Grove, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 109,226, Oct. 15, 1987, abandoned. This application May 5, 1989, Ser. No. 349,897
Int. Cl.[5] B32B *15/08*
U.S. Cl. 428—461 24 Claims

1. A microwave absorbing composite comprising at least two zones of material capable of absorbing microwave energy, said microwave energy absorbing zones consisting of one or more layers of electrically conductive material, each pair of said microwave energy absorbing zones being separated by a

zone of material transparent to microwave energy, said microwave transparent zone consisting of one or more layers of electrically insulative material, and at least one layer of adhesive capable of bonding said composite to a substrate, said adhesive having sufficient mechanical strength to overcome any distortion forces so that said composite does not curl or slip relative to the substrate to which it is adhered as the composite heats in response to microwave energy, provided that said composite is incapable of arcing in a microwave oven whereof the maximum power output does not exceed 2000 watts of a frequency of 2.45 HHz.

4,962,001

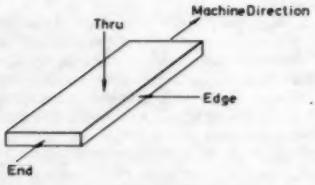
BIAXIALLY ORIENTED POLYOXYMETHYLENE FILM

Kenji Takasa, Yokosuka, and Satoshi Iijima, Kamakura, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 925,606, Oct. 31, 1986, Pat. No. 4,835,245. This application Mar. 20, 1989, Ser. No. 326,063

Int. Cl.[5] B29C *55/12;* **B32B** *27/42*

U.S. Cl. 428—524 **5 Claims**



1. A magnetic recording medium comprising a substrate having a magnetic layer disposed thereon, said substrate comprising a biaxially oriented film of a polyoxymethylene polymer having the main part of each of the main chains thereof substantially composed of repeating units of the oxymethylene group, —CH_2—O— and having a number average molecular weight in a range of from 35,000 to 300,000, which biaxially oriented polyoxymethylene polymer film is characterized by a percent crystallinity as measured by the density method in the range of 75 to 95% and a degree of crystal orientation as measured by the X-ray diffraction method in each of the two directions of end and edge in the range of 80 to 98%.

4,962,002

CERAMIC-METAL COMPOSITE BODIES, AND PROCESS AND APPARATUS FOR MANUFACTURING THE SAME

Akihiko Yoshida, Iwakura, and Yoshizumi Nakasuji, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

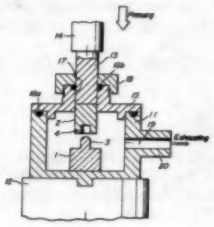
Continuation of Ser. No. 125,361, Nov. 25, 1987, abandoned. This application Jun. 29, 1989, Ser. No. 373,693

Claims priority, application Japan, Dec. 2, 1986, 61-285974

Int. Cl.[5] B23P *19/02;* **F16B** *4/00*

U.S. Cl. 428—609 **4 Claims**

1. A process for producing a ceramic-metal composite body by integrally joining a projection formed on a ceramic member to a recess formed in a metallic member through a fitting technique selected from the group consisting of press fitting, shrinkage fitting, expansion fitting, and a combination thereof, said process comprising fitting and joining the projection of the ceramic member into the recess of the metallic member



while said members are disposed in a vessel maintained in an atmosphere having a pressure of not more than 400 Torr.

4,962,003

DEVELOPMENT OF FUSIBLE ALLOY COMPOSITES

Yoon O. Lhymn, and Chang Lhymn, both of 2908 Bemeat St., Erie, Pa. 16506

Continuation-in-part of Ser. No. 166,060, Mar. 7, 1988, abandoned. This application Apr. 29, 1988, Ser. No. 187,734

Int. Cl.[5] C22C *1/09, 13/00, 13/02*

U.S. Cl. 428—614 **6 Claims**

1. A core for lost core plastic molding of hollow plastic parts, said core having strength sufficient to preclude deformation of the core during plastic molding and having a melting point low enough to permit melt out of the core without degrading the molded part, said core having good melt-flow behavior, said core consisting essentially of a major amount of an alloy of tin and one or more metals selected from the group consisting of lead, antimony, and bismuth and a minor amount of discreet short copper-coated iron or steel fibers dispersed in and bonded to said alloy, said fibers being flowable with the melted alloy during melt out of the core.

4,962,004

METHOD OF INHIBITING ELECTROCHEMICAL REDUCTION OF POLYIMIDE DURING ELECTROPLATING AND ARTICLES FORMED THEREBY

Jieh-Hwa Shyu, Windham, N.H., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Sep. 13, 1989, Ser. No. 406,647

Int. Cl.[5] C25D *5/56*

U.S. Cl. 428—626 **14 Claims**

1. A method of inhibiting degradation of the metal-polyimide bond of a metal-polyimide laminate due to electrochemical reduction of the polyimide during electroplating comprising performing the plating process in an ammonium ions-based plating solution all of whose cations except the metal being plates consist of ammonium ions.

9. A carrier comprising a metal-polyimide laminate and a second metal electroplated onto the metal component of the laminate characterized in that the carrier is substantially devoid of electrochemical reduction-caused deterioration of the carrier's meal-polyimide bond due to the second metal having been electroplated in an ammonium ions-based electroplating solution all of whose cations except the metal being plated consist of ammonium ions.

4,962,005

METHOD OF PROTECTING THE SURFACES OF METAL PARTS AGAINST CORROSION AT HIGH TEMPERATURE, AND A PART TREATED BY THE METHOD

Serge Alperine, Paris, and Pierre Josso, Issy les Moulineaux, both of France, assignors to Office National D'Etudes et de Recherches Aerospatiales, Chatillon Sous Bagneux, France

Filed Oct. 11, 1989, Ser. No. 419,974
Claims priority, application France, Oct. 26, 1988, 88 13991
Int. Cl.[5] B32B *15/04*; C23C *10/52, 10/56*
U.S. Cl. 428—670 29 Claims

1. A coated metal part comprising a metal substrate and a protective coating, wherein said metal substrate consists essentially of at least one metal selected from the group consisting of Ni, Co, and Fe, and said protective coating is free of blisters and consists essentially of a deposit and a predeposit provided between the substrate and the deposit,

wherein said predeposit, which comprises at least one layer, comprises: (1) Pd; and (2) at least one barrier metal selected from the group consisting of Ni, Co, and Cr, wherein said barrier metal is provided on the substrate simultaneously with said Pd and/or said barrier metal forms at least one overlying layer covering the Pd provided on the substrate, and

wherein said deposit comprises a Pd-modified aluminide of the metal which constitutes the metal substrate and is at least one member selected from the group consisting of Ni, Co, and Fe, said aluminide being formed by aluminization of the substrate coated with the predeposit in an atmosphere containing hydrogen, and said aluminide being modified by diffusion of Pd from said predeposit into the deposit.

4,962,006

METHOD OF COLORING CEMENT

Henry C. Oat, Santa Fe, N. Mex., assignor to Color-Crete, Santa Fe, N. Mex.

Continuation of Ser. No. 159,729, Feb. 24, 1988, abandoned, which is a continuation-in-part of Ser. No. 879,449, Jun. 27, 1986, abandoned. This application Nov. 3, 1989, Ser. No. 449,072
Int. Cl.[5] B32B *13/00*; B03D *3/02*
U.S. Cl. 428—703 13 Claims

1. A method of coloring a surface of a preformed cement containing product, comprising

applying a metal sulfate to said surface of said product in the presence of water, and

permitting said metal sulfate to impart a permanent color to said surface under ambient conditions.

4,962,007

FLUTE TUBING OF LAMINATED METAL INCLUDING A BONDED LAYER OF PRECIOUS METAL ALLOY

John J. Phelan, Stoneham, Mass., assignor to Verne Q. Powell Flutes, Inc., Waltham, Mass.

Continuation of Ser. No. 258,077, Oct. 14, 1988, abandoned, which is a continuation of Ser. No. 25,616, Mar. 13, 1987, abandoned. This application Nov. 15, 1989, Ser. No. 437,773
Int. Cl.[5] G10D *7/02*
U.S. Cl. 428—670 21 Claims

1. A flute comprising a plurality of generally tubular segments, one of which contains an embouchure plate and breath hole, and at least another of which contains keys and tone holes, the tubular segments having first and second layers, said first layer defining the outer surface of said tubular segment, said second layer defining the inner surface of said tubular segment, said first and second layers being laminated and metallurgically bonded together as a mechanically unitary structure, said first layer comprising an alloy of a first metal, sand said second layer comprising an alloy of a second metal, at least one of said first metal or said second metal being a precious metal.

4,962,008

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

Tomohiro Kimura, and Yoichi Kawamorita, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 1988, Ser. No. 224,825
Claims priority, application Japan, Jul. 31, 1987, 62-190184
Int. Cl.[5] G03G *5/14*
U.S. Cl. 430—66 13 Claims

1. An electrophotographic photosensitive member having a conductive substrate; a photosensitive layer on said conductive substrate and a surface layer of said photosensitive member containing solid lubricant and silicone oil, wherein the content of the silicone oil is from 10 to 1000 ppm based on the total solids of the surface layer.

4,962,009

MICROCAPSULE CONTAINING PHOTO-OXIDIZING AGENT AND LEUCO DYE

Shintaro Washizu; Jun Yamaguchi; Fumiaki Shinozaki; Akihiro Shimomura; Toshimasa Usami; Toshiaki Endo, and Keiso Saeki, all of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 14, 1988, Ser. No. 257,580
Claims priority, application Japan, Oct. 14, 1987, 62-259111; Nov. 13, 1987, 62-287096; Dec. 25, 1987, 62-329269; Feb. 15, 1988, 63-32426; Apr. 22, 1988, 63-99771
Int. Cl.[5] G03C *1/727, 1/72, 5/00*
U.S. Cl. 430—138 5 Claims

1. An image-forming material consisting essentially of: (a) microcapsules, in which at least one leuco dye capable of developing a color by oxidation and at least one photo-oxidizing agent are enclosed together, and (b) at least one reducing agent no enclosed in said microcapsules, wherein the microcapsules have capsule walls made from a material which lowers its permeability barrier to at least one component selected from said photo-oxidizing agent and said reducing agent when the capsule wall material is heated above its glass transition temperature.

4,962,010

METHOD FOR PRODUCING AMINO-FORMALDEHYDE MICROCAPSULES AND PHOTOSENSITIVE MICROCAPSULES PRODUCED THEREBY

E. Keith Colyer, Kettering; Joseph G. O'Connor, Springboro, and W. A. Hammann, IV, Centerville, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 128,292, Dec. 3, 1987, abandoned. This application Jun. 22, 1989, Ser. No. 370,103

Int. Cl.[5] G03C *1/68;* B01J *13/02*

U.S. Cl. 430—138 15 Claims

1. A process for forming microcapsules having discrete capsule walls comprising the steps of forming an emulsion of an oily core material in a continuous aqueous phase containing methylated polygalacturonic acid and sulfonated polystyrene and enwrapping particles of said oily core material in an amine-formaldehyde condensation product produced by in situ condensation of an amine and formaldehyde.

4,962,011

PHOTOPOLYMERIZABLE RECORDING MATERIALS CONTAINING A TRIAZOLE SENSITIZER AND PHOTORESIST LAYERS AND LITHOGRAPHIC PRINTING PLATES BASED THEREON

Reinhard Aldag, Ludwigshafen; Peter Neumann, Wiesloch; Andreas Boettcher, Leimen; Thomas Bluemel, Erpolzheim, and Friedrich Seitz, Friedelsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

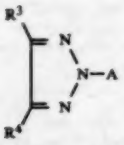
Filed May 17, 1988, Ser. No. 194,954

Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3717038

Int. Cl.[5] G03C *1/70*

U.S. Cl. 430—281 16 Claims

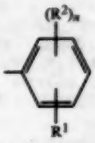
1. A photopolymerizable recording material composed of one or more photopolymerizable olefinically unsaturated organic compounds, a polymeric binder, one or more photopolymerization initiators, a color-forming system which on irradiation with actinic light causes an increase in the color intensity of the recording material, a sensitizer and further auxiliary substances, wherein the sensitizer comprises one or more compounds of the formula I



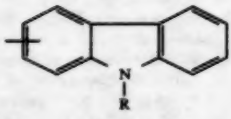
(I)

where

A is one of the radicals of the formulae (II) to (IV)



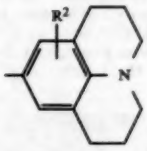
(II)



(III)

or

-continued



(IV)

R is hydrogen or C_1–C_8

R^1 is C_1–C_{12}-alkyl, C_1–C_{12}-alkoxy, phenyl or an NR^5R^6 group where R^5 and R^6 are identical to or different from each other and each is C_1–C_{12}-alkyl; allyl; phenylalkyl having 1 to 4 carbon atoms in the alkyl group; phenyl; phenyl substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen; C_1–C_{12}-alkyl substituted by OH—, halogen-, CN—, —O—CO-alkyl having 1 to 6 carbon atoms in the alkyl group or —CO—O-alkyl having 1 to 6 carbons in the alkyl group; oxaalkyl of 3 to 12 carbon atoms and 1 to 5 oxygen atoms; or R^5 and R^6 carbon atoms and 1 to 5 oxygen atoms; or R^5 and R^6 together form a julolidine, carbazole, morpholine, piperidine or N-alkyl-piperidine radical,

R^2 is hydrogen, C_1–C_{12}-alkyl, C_1–C_{12}-alkoxy, halogen or trialkylsilyl,

n is 1 or 2,

R^3 and R^4 are identical to or different from each other and each is C_1–C_8-alkyl, cycloalkyl, CO_2R^7 where R^7 is C_1–C_8-alkyl, cycloalkyl, CO_2R^7 where R^7 is C_1–C_{12}-alkyl; aryl; phenyl; or phenyl substituted by halogen, C_1–C_{12}-alkyl- or C_1–C_4-alkoxy; or R^3 and R^4 together form a carbocyclic or heterocyclic saturated or unsaturated fused ring system which is monosubstituted or polysubstituted by halogen; OH; CN; —O—CO-alkyl having 1 to 6 carbon atoms in the alkyl group; —CO—O-alkyl having 1 to 8 carbon atoms in the alkyl groupl trifluoromethyl; C_3–C_6-cycloalkyl; C_1–C_8-alkoxy; phenylalkyl having 1 to 4 carbon atoms in the alkyl gorup; C_1–C_{12}-alkyl; C_1–C_{12}-alkyl substituted by OH-, halogen-, CN—, —O—CO-alkyl- having 1 to 6 carbon atoms in the alkyl group, or —CO—O-alkyl having 1 to 6 carbon atoms in the alkyl group; oxaalkyl containing 2 to 12 carbon atoms and 1 to 6 oxygen atoms; trialkylsilyl having 1–4 carbons in the alkyl groups; or NR^8R^9, where R^8 and R^9 are identical to or different from each other and each is C_1–C_8-alkyl; C_1–C_8-alkyl substituted by OH, halogen-, CN—, —O—CO-alkyl having 1 to 6 carbon atoms in the alkyl group or —CO—O-alkyl having 1 to 6 carbon atoms in the alkyl group; oxaalkyl containing 3 to 12 carbon atoms and 1 to 5 oxygen atoms; phenylalkyl having 1 to 4 carbon atoms in the alkyl group; phenyl; or phenyl substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy- or halogen,

with the proviso that the maximum of the long-wave absorption band of these compounds is below 420 nm.

4,962,012

PROCESS FOR PRODUCING PHOTOGRAPHIC RELIEF IMAGES USING PHOTOPOLYMERIZABLE COMPOSITIONS CONTAINING FLUORINATED TITANOCENES

Martin Riediker, Riehen; Martin Roth, Giffers; Niklaus Bühler, Marly, and Joseph Berger, Basle, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 80,241, Jul. 28, 1987, Pat. No. 4,910,121, which is a continuation of Ser. No. 827,046, Feb. 7, 1986, abandoned, which is a division of Ser. No. 576,518, Feb. 2, 1984, Pat. No. 4,590,287. This application Jan. 3, 1990, Ser. No. 460,414

Claims priority, application Switzerland, Feb. 11, 1983, 784/83

Int. Cl.[5] G03C *5/00*

U.S. Cl. 430—311 **5 Claims**

1. A process for the production of a photographic relief image which comprises

exposing imagewise to irradiation a substrate coated with a photopolymerizable composition, which composition can by polymerized by irradiation, which comprises

(a) at least one ethylenically unsaturated monomeric, oligomeric or polymeric compound which reacts by photopolymerization to give high molecular weight products aand which undergoes a change in solubility in doing so, and

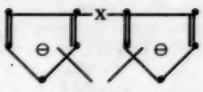
(b) 0.01 to 25% by weight, based on component (a), of at least one titanocene of formula I as photoinitiator

(I)

wherein

M is a tetravalent titanium atom,

R^1 is each independently cyclopentadienyl, indenyl or both symbols R^1 together denote a radical of formula II



(II)

wherein

X is $(CH_2)_n$, in which n is 1, 2 or 3, C_2–C_{12}-alkylidene, cycloalkylidene containing 5 to 7 ring carbon atoms, or R^1 is said cyclopentadienyl, indenyl or radical of formula II which is substituted by alkyl, by alkenyl or by alkoxy of up to 18 carbon atoms; by cycloalkyl or by cycloalkenyl of 5 to 8 ring carbon atoms; by aryl of 6 to 16 carbon atoms; by aralkyl of 7 to 16 carbon atoms; by halogen; by amino or by aminoalkyl of up to 12 carbon atoms wherein the amino group is unsubstituted or substituted by alkyl of up to 12 carbon atoms or quaternized with an alkyl halide of up to 12 carbon atoms,

R^2 is a 6-membered carbocyclic or 5- or 6-membered heterocyclic aromatic ring which is substituted by fluorine atoms in at least one of the two ortho-positions relative to the metal-carbon bond, or R^2 and R^3 together are a radical of the formula III

—Q—Y—Q— (III)

wherein Q is a carbocyclic or heterocyclic 5- or 6-membered aromatic ring and each of the two bonds is in the ortho-position to the Y group and each meta-position to the Y group is substituted by a fluorine atom; or wherein said aromatic ring R^2 or Q, respectively, is further substituted by alkyl or by alkoxy of 1 to 18 carbon atoms, by cycloaklyl of 5 to 6 ring carbon atoms; by aryl of 6 to 16 carbon atoms; by aralkyl of 7 to 16 carbon atoms; by hydroxyl; by carboxyl; by halogen; by amino which is unsubstituted or substituted by alkyl of 1 to 2 carbon atoms or quaternized with an alkyl halide of up to 12 carbon atoms; by pyrrolidino, by piperidino, by piperazino, by morpholino or by N-methylpiperazino; by alkoxycarbonyl of 1 to 18 carbon atoms in the alkoxy moiety; by aminocarbonyl containing one or two C_1–C_{12}-alkyl groups on the amino moiety; by aminocarbonyl containing a pyrrolidino, piperidino, piperazino, N-methylpiperazino or morpholino group; or by aminoalkyl of up to 6 carbon atoms wherein the amino group is unsubstituted or substituted by alkyl of up to 12 carbon atoms or quaternized with an alkyl halide of up to 12 carbon atoms, and Y is CH_2, C_2–C_{12}-alkylidene, cycloalkylidene containing 5 to 7 ring carbon atoms, a direct bond, NR^4, O, S, SO, SO_2 or CO in which R^4 is C_1–C_{12}-alkyl, C_5–C_{12}-cycloalkyl, C_6–C_{16}-aryl or C_7–C_{16}-aralkyl, and

R^3 has the meaning of R^2, and

subsequently removing the non-exposed areas with a solvent.

4,962,013

PHOTOCHROMIC MATERIAL CONTAINING A SPIROOXAZINE AND A NITROXY FREE RADICAL TRIPLET STATE QUENCHER

Yasuo Tateoka, Machida; Masashi Ito, Yokosuka; Shuichi Maeda, Hidaka; Kazuo Mitsuhashi, and Tetsuo Murayama, both of Machida, all of Japan, assignors to Nissan Motor Co., Ltd. Yokohama and Mitsubishi Kasei Corporation, both of Tokyo, Japan

Filed Oct. 14, 1988, Ser. No. 257,903

Claims priority, application Japan, Oct. 16, 1987, 62-259778; Jul. 26, 1988, 63-186376; Sep. 7, 1988, 663-223786

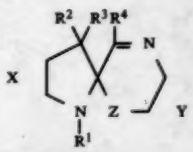
Int. Cl.[5] G03C *1/735, 1/73*

U.S. Cl. 430—338 **27 Claims**

1. A photochromic material comprising:

a substrate material formed of high polymer;

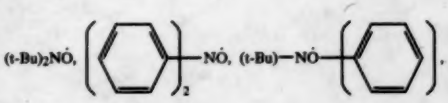
a spirooxazine compound contained in said substrate material and expressed by the general formula:



where R^1, R^2 and R^3 are selected from the group consisting of alkyl group, alkenyl group, cycloalkyl group and aryl group; $R^4$is selected from the group consisting of hydrogen atom and alkyl group having the number of carbon atoms ranging from 1 to 5; rings X and Y are selected from the group consisting of hydrocarbon aromatic ring and heterocyclic aromatic ring; and Z is selected from the group consisting of oxygen atom and sulfur atom; and

a triplet state quencher contained in said substrate material, said triplet state quencher being a nitroxy free radical.

10. A photochromic material as claimed in claim 1, wherein said nitroxy free radical is selected from the group consisting of radicals expressed by the general formulae:



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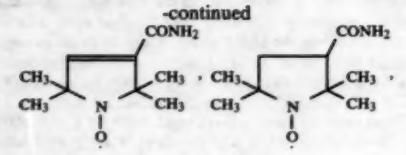

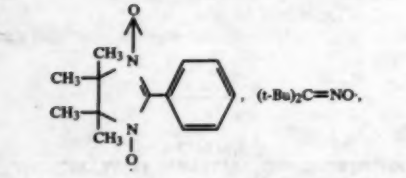

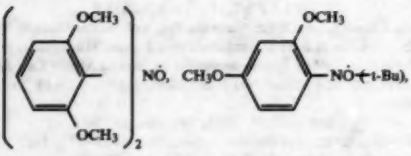

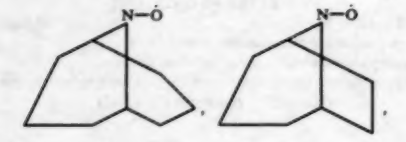

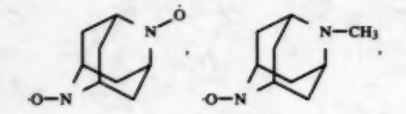

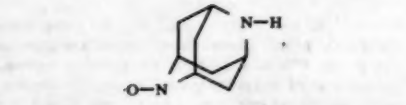

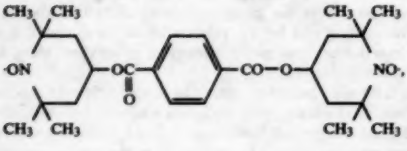

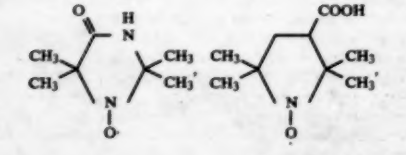

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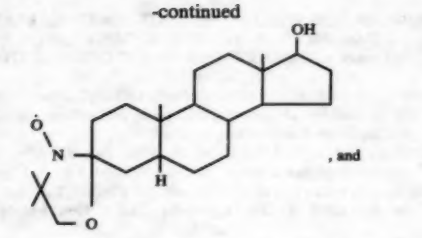
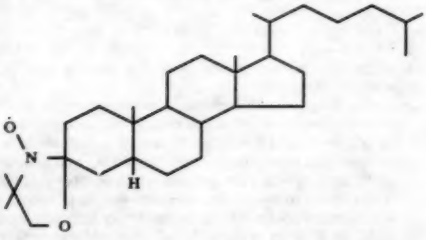




4,962,014

PROCESS FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Takatoshi Ishikawa, and Junya Nakajima, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 927,615, Nov. 6, 1986, abandoned. This application Jan. 19, 1989, Ser. No. 300,685

Claims priority, application Japan, Nov. 6, 1986, 60-247220

Int. Cl.[5] G03C *7/42*

U.S. Cl. 430—393 **18 Claims**

1. A process for processing a silver halide color photographic material having a coated amount of silver of 1.0 g/m^2 or less, after imagewise exposing said silver halide color photographic material, comprising color developing, bleaching, and then washing, wherein the processing time for said bleaching is from 30 seconds to about 70 seconds, the bleaching liquid for said bleaching has a pH of from 4 to 8 and contains from about 0.08 to about 0.30 mol/liter of sulfite ion, and the replenishing amount of washing water for said washing is from about 3 times to about 50 times the amount of processing liquid carried from the previous bath per unit area of said color photographic material.

4,962,015

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Shunichi Aida, and Yoshinori Shibata, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 2, 1989, Ser. No. 346,763

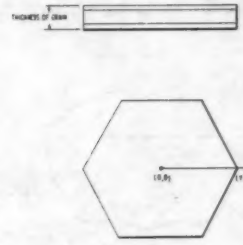
Claims priority, application Japan, May 2, 1988, 63-109548

Int. Cl.[5] G03C *1/02*

U.S. Cl. 430—572 **22 Claims**

1. A silver halide photographic material comprising a support having thereon at least one silver halide emulsion layer containing at least one emulsion in which chemically sensitized silver halide grains composed of tabular silver halide grains having a diameter of a circle corresponding to the projected area of at least 0.4 μm and an average aspect ratio of at least 2 are present in a ratio of at least 50% based on the total projected area of all silver halide grains in the emulsion layer, the tabular silver halide grains having a stratified structure containing at least one layer distinguished from each other with planes substantially parallel to the two main planes facing each other thereof, an average iodine content of the outermost layer in said stratified structure being higher than an average iodine

content of the whole silver halide grain by at least 1 mol %, said silver halide containing gold and silver such that the



weight ratio (gold/silver) of the amount of gold coated per unit area to the amount of silver coated per unit area of the photographic material is not more than 8.0×10^{-6}.

4,962,016

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Shigeo Chino, Tokyo, and Mitsuhiro Okumura, Sagamihara, both of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jan. 23, 1989, Ser. No. 299,591

Claims priority, application Japan, Jan. 30, 1988, 63-20372

Int. Cl.[5] G03C *1/06, 1/30*

U.S. Cl. 430—603 **13 Claims**

1. A silver halide photographic light-sensitive material comprising a support bearing theron, a photographic component layer including a silver halide emulsion layer wherein the swelling degree of said photographic component layer is not higher than 150 and said silver halide emulsion layer is added with elementary sulfur.

4,962,017

SILVER HALIDE PHOTOGRAPHIC MATERIALS

Koki Nakamura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

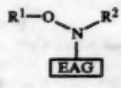
Filed Mar. 30, 1988, Ser. No. 175,374

Claims priority, application Japan, Mar. 30, 1987, 62-76585

Int. Cl.[5] G03C *1/33, 1/34*

U.S. Cl. 430—551 **14 Claims**

1. A silver halide photographic material containing a compound of the general formula (I) which does not release a photographically useful group:



(I)

wherein EAG represents an electron accepting group which can accept an electron from a reducing substance, selected from an aryl group substituted by at least one electron attractive group, a substituted or unsubstituted heterocyclic group, a substituted or unsubstituted quinone residue, vinylogs of said groups and said residues, a nitroalkyl group, a nitroalkenyl group or a monovalent residue of an α-diketo compound; N and O represent a nitrogen atom and an oxygen atom, representively; R^1 and R^2 each represents a substituent except a hydrogen atom; and R^1 and R^2, R^1 and EAG, and R^2 and EAG may be bonded together to form a ring.

4,962,018

PHOTOGRAPHIC MATERIALS CONTAINING DIR COMPOUNDS AND PROCESS OF IMAGING

Richard P. Szajewski; Jerrold N. Poslusny, and Wojciech Slusarek, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 209,741, Jun. 21, 1988, abandoned. This application Apr. 6, 1989, Ser. No. 334,261

Int. Cl.[5] G03C *7/32, 7/26*

U.S. Cl. 430—544 **14 Claims**

1. A photographic element comprising a support bearing at least one photographic silver halide emulsion layer and a development inhibitor releasing coupler comprising a coupler moiety bonded to at least one timing group that enables timing of release of a releasable development inhibitor moiety wherein the releasable development inhibitor moiety contains a $—CH_2—Q$ group that is bonded directly to the inhibitor moiety and that is a group enabling, upon exposure and processing of the element, reduced interlayer interimage effect without reduced image acutance in the emulsion layer, and wherein the inhibitor moiety does not decompose during processing.

4,962,019

INDICATORS FOR THE DETECTION OF THIOL GROUPS

Holger Heidenreich, Cologne, and Klaus Wehling, Wuppertal, both of Fed. Rep. of Germany, assignors to Miles Inc., Elkhart, Ind.

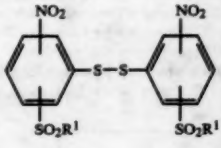
Division of Ser. No. 432,466, Nov. 7, 1989, Pat. No. 4,931,579, which is a continuation-in-part of Ser. No. 105,565, Oct. 8, 1987, abandoned. This application Feb. 20, 1990, Ser. No. 481,618

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1986, 3634525

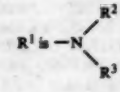
Int. Cl.[5] C12Q *1/25; C07C 311/17*

U.S. Cl. 435—4 **5 Claims**

1. The compound having the general formula



wherein



and

R^2 is C_1–C_4-alkyl; C_1–C_4 alkyl substituted by halogen, C_1–C_4-alkoxy, hydroxyl, $—OSO_3H$, $—SO_3H$, amino, or amino substituted by C_1–C_4-alkyl; wherein the C_1–C_4 alkyl maybe substituted by halogen, hydroxyl, $—OSO_3H$, $—SO_3H$, phenyl or a benzyl group;

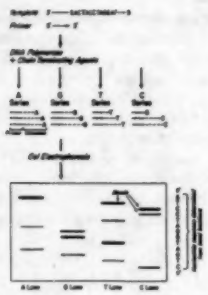
R^3 is hydrogen or R^2.

4. A test agent having as an indicator a compound of claim 1 in combination with an enzyme.

4,962,020
DNA SEQUENCING

Stanley Tabor, Cambridge, and Charles C. Richardson, Chestnut Hill, both of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Filed Jul. 12, 1988, Ser. No. 218,103
Int. Cl.[5] C12Q *1/68*
U.S. Cl. 435—6 **34 Claims**



1. A method for sequencing a strand of DNA, comprising the steps of:

providing said strand hybridized with a primer able to hybridize to said strand, to give an hybridized mixture,

incubating said hydridized mixture with four deoxyribonucleoside triphosphates, a DNA polymerase, and a first chain terminating agent, wherein said DNA polymerase causes said primer to be elongated to form a first series of first DNA products differing in the length of the elongated primer, each said first DNA product having a said chain terminating agent at its elongated end, the number of molecules of each said first DNA products being approximately the same for substantially all DNA products differing in length by no more than 20 bases, and providing a second chain terminating agent in said hybridized mixture at a concentration different from said first chain terminating agent, wherein said DNA polymerase causes production of a second series of second DNA products differing in the length of the elongated primer, each said second DNA product having said second chain terminating agent at its elongated end, the number of molecules of each said second DNA products being approximately the same for substantially all second DNA products differing in length from each other by from 1 to 20 bases, and being distinctly different from the number of molecules of all said first DNA products having a length differing by no more than 20 bases from that of said second DNA products.

4,962,021
ANALYTE DETERMINATION USING GEL INCLUDING A REAGENT SYSTEM REACTS WITH ANALYTE TO CHANGE TRANSMISSIVE PROPERTY OF GEL DETECTABLE BY LIGHT BEAM TRANSMITTED THROUGH GEL BY TOTAL INTERNAL REFLECTANCE

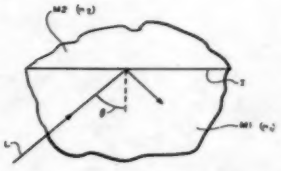
Peter M. Meserol, Montville; Philip Bernstein, Glen Ridge; Rita C. Prodell, Morris Plains, and Gargi Gupta, Morris Plains, all of N.J., assignors to Personal Diagnostics, Inc., Whippany, N.J.

Filed Jun. 20, 1986, Ser. No. 876,473
Int. Cl.[5] C12Q *1/00*; C12M *1/00*; G01N *33/00*
U.S. Cl. 435—7 **29 Claims**

4. A process for determining analyte in a sample, comprising:

providing an optically transparent gel body in the shape of a dove prism, said gel body not being an optical fiber and said gel body containing a reagent system which in the presence of analyte changes a transmissive property of the gel body;

supporting said gel body to present a first surface portion for having said analyte applied thereto and to present a second surface portion for having a beam of light directed thereagainst



applying a sample containing an analyte to be determined to said first surface portion of said gel body, directing a beam of light against said second surface portion of said gel body to transmit light through said gel body; and detecting light transmitted through the gel body as a determination of analyte.

4,962,022
STORAGE AND USE OF LIPOSOMES

Beverly M. Fleming, and James P. Mapes, both of Raleigh, N.C., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 22, 1986, Ser. No. 910,413
Int. Cl.[5] G01N *33/53, 33/543*; A01N *25/26*; A61K *37/22*
U.S. Cl. 435—7 **19 Claims**

1. A composition comprising:

an aqueous buffer and liposomes in the aqueous buffer, said aqueous buffer being at a pH of from 6.5 to 8.5, and further including a polyol in an amount of from 0.6 to 1.5 g per 100 ml. of buffer.

9. A tracer composition for use in an assay for an analyte, comprising:

a liposome including a detectable marker, said liposome being derivatized with a ligand, said liposome being in an aqueous buffer maintained at a pH of from 6.5 to 8.5, said aqueous buffer including a polyol in an amount of from 0.6 to 1.5 g. per 100 ml of buffer.

4,962,023
SINGLE INCUBATION IMMUNO SORBENT ASSAY METHOD USING PARTICLE LABELS TO DETECT TEST ANTIGEN SPECIFIC ANTIBODIES IN PRESENCE OF OTHER ANTIBODIES

William J. Todd, Baton Rouge, La., and Paul A. Barstad, Frederick, Md., assignors to Louisiana State University, Agricultural and Mechanical College, Baton Rouge, La.

Filed Jun. 22, 1987, Ser. No. 66,763
Int. Cl.[5] G01N *33/53, 33/543, 33/544, 33/541*
U.S. Cl. 435—7 **19 Claims**

1. An immunoblot assay method for analyzing a test sample for the detection of test-antigen specific antibodies in the presence of non-test-antigen specific antibodies, which comprises

binding a detecting amount of at least one known test antigen to a localized site on a solid phase substrate;

immersing said solid phase substrate, to which said antigen is bound, in a signal developing reagent reactive with both said test-antigen specific antibodies and said non-test-antigen specific antibodies sufficient to label both the test-antigen specific antibodies and the non-test-antigen specific antibodies:

adding the test sample, which contains both test-antigen specific antibodies and non-test-antigen specific antibodies to said signal developing reagent and said immersed solid phase substrate, to which said test antigen is bound, incu-

bating in a single step to form a single reaction mixture; incubating said mixture; and

detecting a signal in said reaction mixture produced by said signal developing reagent, wherein a positive result for test-antigen specific antibodies in said test sample is indicated by localization of said signal in said reaction mixture at said substrate bound test antigen site.

4,962,024

SIGNAL ENHANCEMENT IN ASSAY FOR AN ENZYME

Thomas H. Schulte, Cary, N.C., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Aug. 11, 1988, Ser. No. 230,933

The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.

Int. Cl.[5] C12Q *1/54, 1/48*

U.S. Cl. 435—14 **20 Claims**

1. A method for determining an enzyme in a liquid comprising:

(a) combining a liquid suspected of containing an unknown enzyme with a second enzyme and a blocked fluoroketone inhibitor of said second enzyme, said unknown enzyme hydrolyzing said blocked fluoroketone inhibitor to a fluoroketone inhibitor;

(b) adding a substrate for said second enzyme, said fluoroketone inhibitor inhibiting hydrolysis of said substrate to a colored product by said second enzyme; and

(c) determining said unknown enzyme by detecting a signal associated with said colored product.

4,962,025

REAGENT ALCOHOL TEST STRIP DEVICE

Mervin J. Moldowan, 480 Benton View Dr., Philomath, Oreg. 97370

Continuation of Ser. No. 815,809, Jan. 2, 1986, abandoned. This application Mar. 17, 1987, Ser. No. 28,022

Int. Cl.[5] C12Q *1/26;* G01N *31/22*

U.S. Cl. 435—25 **23 Claims**

1. A test strip for the detection and determination of the concentration of alcohol in samples of fluids comprising:

(a) a substrate to hold various pieces of a test strip in place,

(b) a collection site attached to one end of the substrate consisting of a suitable material to absorb a sample to transfer to a reaction site,

(c) a reaction site attached to the substrate in spaced relationship to the collection site, said reaction site containing alcohol metabolizing enzymes that will catalyze the oxidation of an alcohol and further containing additional, enzymes and reagents that will provide a visible response of a color change upon reaction with an alcohol, and

(d) a color chart, respresenting specific alcohol concentrations, attached to the substrate to permit comparison of the color of the reaction site to determine the concentration of an alcohol in a fluid test sample.

4,962,026

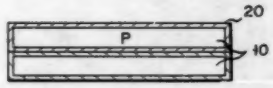
PROCESS FOR THE PRODUCTION OF PANOSYL DERIVATIVES

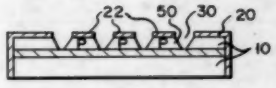
Jiun G. Keng, Darien, Ill., assignor to Enzyme Bio-Systems, Ltd., Englewood Cliffs, N.J.

Filed Sep. 15, 1986, Ser. No. 907,554

Int. Cl.[5] C12P *19/16, 19/44, 19/14;* C12N *9/28*

U.S. Cl. 435—98 **2 Claims**





1. An in vitro enzymatic process for preparing a panosyl derivative of a panosyl acceptor which comprises allowing a panosyl transferase enzyme to react on an aqueous solution containing pullulan and said panosyl acceptor for a sufficient time to produce a panosyl derivative of said panosyl acceptor, wherein the panosyl acceptor is selected from the group consisting of D-glucose, sucrose, alpha-methylglucoside, stevioside and hesperetin dihydrochalcone glucoside, wherein the enzyme is the pullulan hydrolyzing alpha-amylase produced by *Bacillus megaterium* NCIB 11568 or *Bacillus subtilis* NCIB 11980, which exhibits panosyl transferase activity.

4,962,027

PRODUCTION OF 3-HYDROXYPROPIONALDEHYDE FROM GLYCEROL BY *KLEBSIELLA PNEUMONIAE*

Patricia J. Slininger, Metamora; James E. Vancauwenberge, Normal, and Rodney J. Bothast, East Peoria, all of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 7, 1986, Ser. No. 894,140

Int. Cl.[5] C12P *7/24, 7/02;* C12N *1/38, 1/12*

U.S. Cl. 435—147 **3 Claims**

1. A method for the production of 3-hydroxypropionaldehyde (3-HPA) from glycerol, which comprises culturing the bacterium *Klebsiella pneumoniae* NRRL B-4011 or subcultures thereof, under aerobic conditions, in an aqueous nutrient medium containing an amount of glycerol effective for the induction of glycerol dehydratase and the production of a recoverable quantity of 3-HPA, and an amount of semicarbazide hydrochloride sufficient to prevent the conversion of 3-HPA to trimethylene glycol, until a recoverable quantity of 3-HPA is produced.

4,962,028

PLANT PROMOTORS

John R. Bedbrook, Piedmont; Caroline Dean, Alameda, and Pamela Dunsmuir, Piedmont, all of Calif., assignors to DNA Plant Technology Corporation, Mt. Kisco, N.Y.

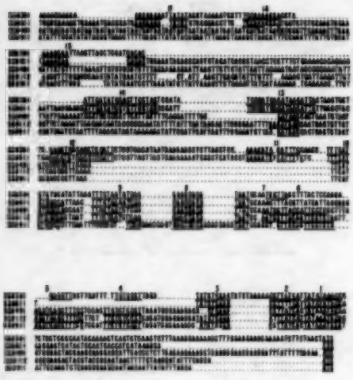
Filed Jul. 9, 1986, Ser. No. 883,604

Int. Cl.[5] C12N *15/00*

U.S. Cl. 435—172.3 **14 Claims**

1. An isolated recombinant DNA molecule comprising a DNA promoter sequence capable of directing transcription of

downstream foreign structural genes in plants, said sequence comprising less than about 5,000 base pairs of 5' region DNA counted upstream from the translation start site of the Petunia



gene for the small subunit ribulose-1, 5-bisphosphate carboxylase and said sequence selected from the group consisting of SSU301 and SSU611.

4,962,029

COVALENT OLIGONUCLEOTIDE-HORSERADISH PEROXIDASE CONJUGATE

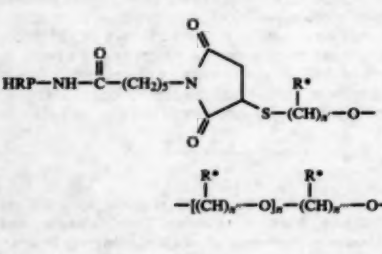
Corey Levenson, Oakland; Chu-an Chang, El Cerrito, both of Calif., and Fred T. Oakes, Rochester, N.Y., assignors to Cetus Corporation, Emeryville, Calif.

Continuation of Ser. No. 103,978, Oct. 2, 1987, abandoned. This application Nov. 16, 1989, Ser. No. 437,311

Int. Cl.[5] C12N *9/08*; C12Q *1/28*

U.S. Cl. 435—192 8 Claims

1. A covalent conjugate of an oligonucleotide chain and horseradish peroxidase given by the structure



wherein

R* is hydrogen or —CH_2OH;

n', n'' and n''' are integers in the range of 2 and 10 inclusive;

n is an integer in the range of 2 and 30 inclusive; and

X is an oligonucleotide chain.

4,962,030

ALKALINE CELLULASES AND MICROORGANISMS CAPABLE OF PRODUCING SAME

Shuji Kawai, Utsunomiya; Kazushi Oshino, Koshigaya; Hiromi Okoshi, Utsunomiya; Hajime Mori, Utsunomiya; Katsuya Ozaki, Utsunomiya; Shitsuw Shikata, Utsunomiya; Susumu Ito, Utsunomiya, and Kikuhiko Okamoto, Koshigaya, all of Japan, assignors to KAO Corporation, Tokyo, Japan

Filed Nov. 27, 1987, Ser. No. 126,005

Claims priority, application Japan, Nov. 27, 1986, 61-282970; Nov. 28, 1986, 61-283742; Nov. 28, 1986, 61-283743; Nov. 28, 1986, 61-283744; Mar. 12, 1987, 62-57644; Mar. 20, 1987, 62-67442; Mar. 23, 1987, 62-68597; Aug. 3, 1987, 62-194142; Aug. 3, 1987, 62-194143; Aug. 3, 1987, 62-194140

Int. Cl.[5] C12N *9/42*; C12R *1/07*

U.S. Cl. 435—209 14 Claims

1. A substantially pure alkaline cellulase enzyme K-580 isolated from Bacillus species KSM-580 having the following enzymatic properties:

(1) Action:

acting well on cellulosic materials including carboxymethyl cellulose, cellulose, filter paper and microcrystalline cellulose and causing them to be dissolved, thereby forming reducing sugars such as glucose;

(2) Substrate specificity:

having activity on carboxymethyl cellulose, cellulose powder, microcrystalline cellulose and filter paper;

(3) Working pH and optimum pH:

a working pH range from 3 to 12.5 and an optimum pH from 7 to 10 with a relative activity of not less than 50% of the activity at an optimum pH being shown in the range of 4.5 to 10.5;

(4) pH stability:

very stable and not inactivated at a pH of 4.5 to 12 and an activity of not less than about 50% being maintained at a pH of 3.5 to 12.5;

(5) Optimum temperature:

a working temperature in a wide range of 15 to 80° C. and an optimum temperature of 65° C.; in the range of 50° to 75° C., the activity is not less than 50% of the activity at the optimum temperature;

(6) Molecular weight;

peaks of the molecular weight are at about 18,000 and about 50,000 (when determined by gel filtration);

(7) Influences of metal ions;

inhibited by Hg^{2+} and activated by Ba^{2+}, Ca^{2+}, Co^{2+} and Cd^{2+};

(8) Influences of surface active agents:

sodium linear alkylbenzenesulfonates, sodium alkylsulfates, sodium polyoxyethylene alkylsulfates, sodium alpha-olefin sulfonates, sodium alpha-sulfonated aliphatic acid esters, sodium alkylsulfonates, soaps and polyoxyethylene secondary alkyl ethers rarely inhibit the activity;

(9) Proteinase resistance;

resistant to proteinases;

(10) Influences of chelating agents:

ethylenediamine tetraacetic acid, ethyleneglycolbis-(beta-aminoethylether)-N,N,N',N''-tetraacetic acid, citric acid, sodium tripolyphosphate and zeolite do not inhibit the activity.

4,962,031

PROCESS FOR PRODUCING OPTICALLY ACTIVE COMPOUNDS

Naoyuki Toshida; Masakazu Kaneoya; Manabu Uchida, and Hiroshi Morita, all of Kanagawa, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed May 2, 1988, Ser. No. 189,163

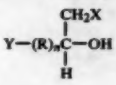
Claims priority, application Japan, May 1, 1987, 62-106276

Int. Cl.[5] C12P *41/00*

U.S. Cl. 435—280 9 Claims

1. A process for producing an optically active compound which comprises reacting under substantially anhydrous con-

ditions and in the presence of lipase obtained from a *Pseudomonas* species, a triglyceride and an (R,S)-compound represented by the general formula (I):



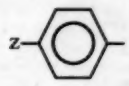
(I)

wherein

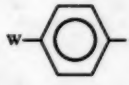
X is a member selected from the group consisting of chlorine, bromine and fluorine,

Y is a member selected from the group consisting of chlorine, bromine, fluorine, cyano, alkyloxycarbonyl in which the alkyl moiety is of 1–20 carbon atoms and

a group of the following formula:



wherein Z is hydrogen, halogen, alkyl of 1–20 carbon atoms, alkoxy of 1–20 carbon atoms or a group of the following formula:



wherein W is alkyl of 1–2 carbon atoms or alkoxy of 1–20 carbon atoms,

R is alkylene of 1–20 carbon atoms; and

n is 0 or 1,

to effect a transesterification reaction, and resolving to an optically active α-halogeno alcohol which has either the R- or S-configuration and the corresponding ester of the S- or R-alcohol.

4,962,032

ANTI-LAFORA BODY MONOCLONAL ANTIBODY

Hajime Yoshida, Sagamihara, Japan; Nobuo Hanai, Mercer Island, Wash., and Akiko Furuya, Machida, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1987, Ser. No. 72,293

Claims priority, application Japan, Jul. 11, 1986, 61-163414

Int. Cl.[5] C07K *15/28*; C12N *5/20*; G01N *33/535, 33/53*

U.S. Cl. 435—240.27 **8 Claims**

1. A monoclonal antibody of the IgG class that binds with abnormal glycogen from patients with Lafora disease, or with abnormal glycogen from patients with type IV glycogenosis but not with normal glycogen, and obtainable from hybridoma cell line KM-279, E.C.A.C.C. No. 86070304.

4,962,033

ROLLER BOTTLE METHOD OF CULTURING CELLS

Jonathan M. Serkes, Oak View, and William L. Foschaar, Camarillo, both of Calif., assignors to In Vitro Scientific Products, Ventura, Calif.

Division of Ser. No. 201,429, Jun. 2, 1988, which is a continuation-in-part of Ser. No. 130,740, Dec. 9, 1987, Pat. No. 4,824,787. This application Jun. 12, 1989, Ser. No. 364,322

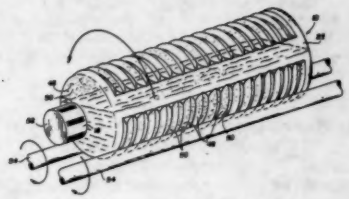
Int. Cl.[5] C12N *5/00*

U.S. Cl. 435—240.243 **20 Claims**

1. A method of culturing cells comprising the steps of:

attaching a layer of cells to the interior surface of a cylindrical synthetic resin roller bottle having a pleated segment with pleats disposed crosswise to the axis of the bottle and including at least one flat , unpleated axial panel forming at least 5% of the circumference of the plated segment for forming a drain panel for emptying the contents of the bottle, said roller bottle having a surface at least 110% the surface of a roller bottle having an unpleated cylindrical segment having the same external diameter;

adding a culture medium to the interior surface of the roller bottle;



rolling the bottle while culturing the cells;

orienting the bottle with the drain panel facing downwardly; and

tilting the bottle to drain the culture medium and cells from the bottle.

4,962,034

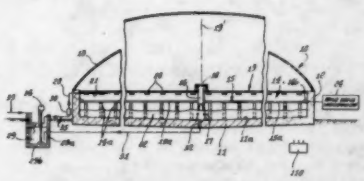
BIOREMEDIATION OF ORGANIC CONTAMINATED SOIL AND APPARATUS THEREFOR

Khalique A. Khan, Pasadena, Calif., assignor to Aerovironment, Inc., Monrovia, Calif.

Filed Mar. 15, 1989, Ser. No. 323,798

Int. Cl.[5] C12M *1/06*

U.S. Cl. 435—262 **15 Claims**



1. A trickling filter system to treat contaminated soil containing de-contaminating microorganisms, and that prevent its migration, the system being closed to control release of organics, comprising

(a) a reactor vessel having a floor, a side wall or walls, and a cover, to contain the soil,

(b) a contaminated soil bed received into the vessel and onto the vessel floor,

(c) a rotary raking apparatus including rake arms in the vessel, and a rotary drive therefor, to rotatably displace the arms for raking the soil, the rake arms supported to project downwardly into the soil, from the vessel interior thereabove,

(d) and a sprinkling system in the vessel to sprinkle liquid onto the raked soil, and

(e) a sump associated with the reactor vessel to receive liquid that drains from the soil, and to supply said liquid to said sprinkling system,

(f) said liquid including water and organics dissolved in the water,

(g) and oxygenating means associated with said vessel.

4,962,035

DNA ENCODING IGE RECEPTOR ALPHA-SUBUNIT OR FRAGMENT THEREOF

Philip Leder, Chestnut Hill, Mass.; Akira Shimizu, Kyoto, Japan; Reuben Siraganian, Bethesda, Md., and Philip Benfey, New York, N.Y., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Filed Dec. 1, 1987, Ser. No. 127,214
Int. Cl.[5] C12N *15/00, 15/11*; C07H *21/04*
U.S. Cl. 435—320 2 Claims

1. A cDNA sequence encoding the α-subunit of human mast cell IgE surface receptor or an IgE binding fragment thereof.

4,962,036

MICROORGANISM DETERMINATION WITH A SORBENT PACKED COLUMN

Pavel Cermák; Václav Monhart; Jire,acu/l Horák; Marie Tlustáková, and Miroslav Paroubek, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Sep. 25, 1987, Ser. No. 101,376
Claims priority, application Czechoslovakia, Sep. 29, 1986, 6957-86
Int. Cl.[5] C12Q *1/04, 1/02*; C12N *11/08*; C12M *1/00*
U.S. Cl. 435—34 8 Claims

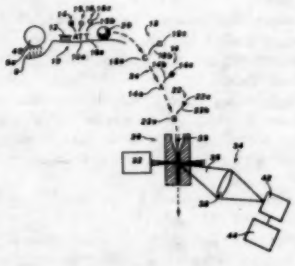
3. A diagnostic column for determining the presence of a microorganism in a body liquor, comprising a substantially cylindrical column body connected at each end via porous partitions having different porosities to conical terminals, one of said conical terminals having an inlet for the column and the other of said conical terminals having an outlet, all components of the column being made from biocompatible material and having a smooth inner surface, the column having a sorbent capable of trapping said microorganism placed between said partitions, said partitions supporting said sorbent and being made from a porous material, the total inner volume of the column being from about 30 to about 300 ml,and the volume of the body of the cylindrical column being about 10 to 100 ml and the total volume of both conic terminals of the column being about 20 to 200 ml.

4,962,037

METHOD FOR RAPID BASE SEQUENCING IN DNA AND RNA

James H. Jett; Richard A. Keller; John C. Martin; Robert K. Moyzis; Robert L. Ratliff; E. Brooks Shera, and Carleton C. Stewart, all of Los Alamos, N. Mex., assignors to United States of America, Washington, D.C.

Filed Oct. 7, 1987, Ser. No. 105,375
Int. Cl.[5] C12Q *1/68*
U.S. Cl. 435—6 21 Claims



1. A method for DNA and RNA base sequencing, comprising the steps of:

isolating a single fragment of DNA or RNA;

introducing said single fragment into a moving sample stream;

sequentially cleaving the end base from the DNA or RNA fragment with exonuclease to form a train of said bases; and

detecting said bases in said train in sequential passage through a detector which detects single molecules.

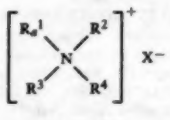
4,962,038

MULTI-PURPOSE BLOOD DILUENT AND LYSING AGENT FOR DIFFERENTIAL DETERMINATION OF LYMPHOID-MYELOID POPULATION OF LEUKOCYTES

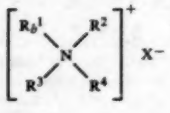
James H. Carter, Ft. Lauderdale; Stephen L. Ledis, Hialeah, and Harold R. Crews, Miami, all of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Continuation of Ser. No. 395,530, Jul. 6, 1982, Pat. No. 4,521,518, which is a continuation of Ser. No. 159,782, Jun. 16, 1980, Pat. No. 4,346,018. This application May 17, 1985, Ser. No. 735,245
The portion of the term of this patent subsequent to Sep. 1, 1998, has been disclaimed.
Int. Cl.[5] G01N *31/00*
U.S. Cl. 436—10 14 Claims

1. A lysing reagent for use with a diluted sample of whole blood, said lysing reagent comprising: a mixture of an aqueous solution formed by admixing at least two substantially pure quaternary ammonium salts, the combination of said salts being in an amount such that said reagent exhibits surface active properties effective to generate with automatic counting systems at least a two-volume leukocyte histogram, with separation of at least two leukocyte populations; one of said quaternary ammonium salts having the formula I_a and the other of said quaternary salts having the formula I_b



I_a



I_b

wherein R_a^1 and R_b^1 are long chain alkyl radicals; R_a^1 is long chain alkyl radical having 12 carbon atoms; R_b^1 is selected from the group consisting of long chain alkyl radicals having 14 carbon atoms, 16 carbon atoms, and mixtures thereof; R^2, R^3, and R^4 are short chain alkyl radicals having 1 to 6 carbon atoms; and X^{31} is a salt forming radical, selected from the group consisting of Cl^-, Br^-, I^-, PO_3^-, HSO_4^-, and $CH_3SO_4^-$; and an isotonic blood diluent, said diluent comprising an aqueous solution of a blood cell stabilizing mixture including sodium sulfate and sodium chloride, said mixture being in suitable concentration to slow kinetics of cytoplasmic stripping from the leukocytes; such stripping being caused by said lysing reagent and being slowed to a degree which allows measurement of individual volumes of the cells of said leukocyte populations, while stabilizing hemogram parameters; and said diluent being substantially neutral.

4,962,039

SIMPLE AND RAPID METHOD FOR DETECTING THE PRESENCE OF WATER IN VARIOUS ORGANIC FLUIDS

Donald T. Benedyk, Brighton, Mich., assignor to 2V Industries, Inc., Wixom, Mich.

Filed Jun. 30, 1988, Ser. No. 214,016
Int. Cl.[5] C09C 3/00; G01N 33/18
U.S. Cl. 436—40 10 Claims

1. A method for detecting the presence of water in an organic fluid selected from the group consisting of transmission fluid, cutting oil, hydraulic fluid, and mixtures thereof comprising the steps of:

a. first, admixing a portion of the organic fluid with a measured amount of a liquid indicator system, the liquid indicator system comprising an anhydrous non-polar solvent selected from the group consisting of mineral seal oil, mineral spirits, kerosene, and mixtures thereof having a boiling point between about 180° and about 300° F. and a flash point between about 100° F. and about 150° F. in the organic fluid, and a non-hazardous water soluble dye which is essentially insoluble and colorless in the anhydrous, non-polar solvent and evidences a color change upon direct contact with water, the dye being present in an amount between about 0.044 mg. dye per 5 ml of solvent and about 0.3 mg dye per 5 ml solvent;

b. second, intimately dispersing any water contained in the organic fluid throughout the combined mixture by agitating the combined mixture for a period sufficient to provide intimate contact between the indicator system and the organic fluid; and

c. third, allowing the agitated mixture to sit for a period sufficient to permit any water present in the mixture to react with the water soluble dye.

9. A liquid indicator system suitable for detecting trace amounts of water in organic fluids consisting essentially of:

an anhydrous non-polar solvent selected from the group consisting of kerosene, mineral spirits, mineral seal oil and mixtures thereof which are essentially immiscible in water; and

a water soluble dye present in the solvent in concentrations between about 0.001% and about 0.1%, said dye being capable of reacting in the presence of trace amounts of water to yield a colored solution, said dye selected from the group consisting of Acid Blue 9, Acid Blue 1, Acid Blue 25, Acid Blue 45, Direct Blue 86, FD and C Blue 1, Basic Blue 7, Acid Red 73, Acid Red 52, Acid Red 14, Acid Yellow 73, Acid Yellow 17, Acid Yellow 23 and Acid Green 1.

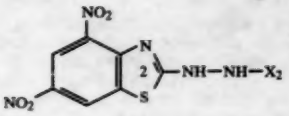
4,962,040

2-HYDRAZONO-4,6-DINITROBENZTHIAZOLONES USEFUL TO FORM DYESTUFFS AND AS COLOR FORMERS FOR DETECTING PEROXIDE

Herbert Hugl, Bergisch Gladbach; Aloysius Engel, Leverkusen, and Klaus Wehling, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 55,098, May 28, 1987, abandoned. This application Aug. 10, 1989, Ser. No. 392,520
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1986, 3618752
Int. Cl.[5] G01N 31/14; C09B 29/045; D06P 1/04, 1/06
U.S. Cl. 436—135 1 Claim

1. In a process for the determination of hydrogen peroxide in aqueous liquids, in which process a sample of the liquid to be analyzed is brought into contact with a substance having peroxidative activity and a color former which reacts to form a dyestuff in the presence of hydrogen peroxide and the substance having peroxidative activity and a coupling component, the improvement comprising the use of a 2-hydrazono,-4,6-dinitrobenzthiazolone of the formula



in which

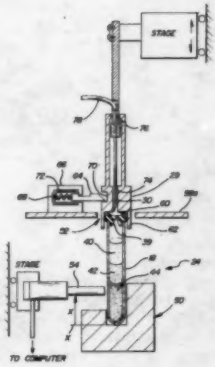
X_2 represents hydrogen.

4,962,041

METHOD AND APPARATUS FOR AUTOMATIC PROCESSING AND ANALYZING OF BLOOD SERUM

Edward T. Roginski, Hamtramck, Mich., assignor to Medical Automation Specialities, Inc., Hamtramck, Mich.

Continuation-in-part of Ser. No. 254,420, Oct. 6, 1988. This application Mar. 29, 1989, Ser. No. 330,151
Int. Cl.[5] G01N 27/02, 33/48
U.S. Cl. 436—150 15 Claims



1. A method for inspecting a test tube containing a layer of blood cells, a layer of separator gel and a layer of blood serum so as to ascertain the relative position of said layers, the method comprising:

supporting the test tube;

providing a capacitive sensor probe operative to provide an output signal corresponding to the dielectric constant of a material proximate thereto;

providing relative motion between the sensor probe and the test tube, while maintaining the sensor probe at a fixed distance from the test tube;

providing signalling means for generating positional signals indicative of the position of the sensor probe relative to the test tube;

analyzing the signals from the sensor probe and the signalling means and correlating changes in the sensor probe output signal with the position of the sensor probe relative to the test tube.

4,962,042

METHOD FOR ON-COLUMN INJECTION GAS CHROMATOGRAPHY

Paul L. Morabito; Richard G. Melcher; Joseph F. Hiller, and Terrence McCabe, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 198,425, May 25, 1988, abandoned. This application Dec. 8, 1989, Ser. No. 448,410
Int. Cl.[5] G01N 31/08
U.S. Cl. 436—161 11 Claims

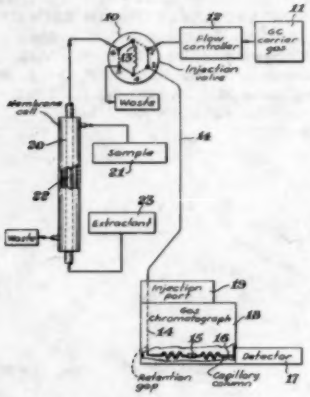
1. A method for on-column valved injection gas chromatog-

raphy with reduced analysis time, comprising the sequential steps of:

(a) flowing a stream of gas through an injection valve, a capillary gas chromatography retention gap and a capillary gas chromatography column at a first flow rate;

(b) injecting a predetermined volume of a liquid sample containing a solvent and a component of interest into the capillary gas chromatography retention gap using the injection valve, the predetermined volume being more than 5 microliters and less than 1 milliliter;

(c) flowing a stream of gas through the capillary gas chromatography retention gap and the gas chromatography



column at a second flow rate, the second flow rate being at least 50% higher than the first flow rate and the second flow rate being attained in less than about one second so that at least 50% of the solvent is moved through the capillary gas chromatography retention gap and the capillary gas chromatography column at at least a 50% increased rate;

(d) flowing a stream of gas through the capillary gas chromatography retention gap and the capillary gas chromatography column at a third flow rate, the third flow rate being at least 50% lower than the second flow rate so that the component of interest can be chromatographed.

4,962,043

SIMPLIFIED DETECTION IMPLEMENT

Moriharu Nagase, Ebina; Mutsumi Shibuya, Yokohama; Kuniaki Asami, Tokyo; Katsuo Matsumoto, Furukawa; Hikaru Teranishi, Iwadeyama, and Sukeo Saito, Yokohama, all of Japan, assignors to Showa Yakuhin Kako Co., Ltd, Tokyo and Nitto Electric Industrial Co., Ltd., Osaka, both of, Japan

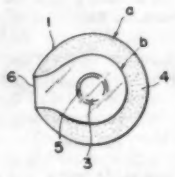
Continuation of Ser. No. 53,148, May 21, 1987, abandoned, which is a continuation of Ser. No. 682,263, Dec. 17, 1984, abandoned. This application Apr. 3, 1989, Ser. No. 332,621

Claims priority, application Japan, Dec. 20, 1983, 58-240653

Int. Cl.[5] **G01N** *1/28*

U.S. Cl. 436—165 **7 Claims**

1. The method of carrying out an analysis of a fluid sample of a substance with a test reagent, the analysis requiring heat from a heat source, said heat source including a part of the human body, which consists of placing an adhesive layer (4) onto one side of an adhesive sheet (1), said adhesive sheet consisting of portion a and portion b, said portion a being larger than portion b, a single folding line located at the intersection of portions a and b, said portion b being transparent, placing a porous test material (3) of size smaller than each of said portions a and b onto said adhesive layer at about the center of said portion a, impregnating said test material with said test reagent, covering the entire surface of said adhesive layer with a peelable protective sheet (2), said protective sheet having an opening (5) of size at least as large as said test material whereby said test material is not in contact with said protective sheet, placing a drop of said fluid sample to be analyzed onto said test material, peeling off said protective sheet, folding said adhesive sheet at said folding line inwardly whereby said



portion a overlaps portion b, and forms a folded sheet, said test material then being exposed and then being seen through said portion b, said adhesive layer holding said portions a and b together and a part of portion a protruding beyond portion b to form a protruding part, adhering said protruding part to said heat source whereby said folded sheet containing said test material is heated and the result of the analysis is detected through said transparent portion b.

4,962,044

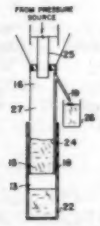
TEST TUBE FILTER/DISPENSER APPARATUS AND METHOD

Ernest A. Knesel, Jr., Greensboro; Daniel R. Shoemaker, Elon College, and David V. Fansler, Graham, all of N.C., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 25, 1988, Ser. No. 185,655

Int. Cl.[5] **B01D** *33/00, 37/00*

U.S. Cl. 436—177 **15 Claims**



1. A piston-type filter/dispenser vial for dispensing measured aliquots of filtrate upon the application of air pressure to said vial from an external air pressure source, said vial comprising:

a. an elongated hollow shaft for the collection of liquid including a side wall defining an interior, said hollow shaft having an upper end and a lower end;

b. a piston fit filter means located in and closing the said lower end of the hollow shaft, said filter means providing a sealing and sliding contact with the inside surface of a test tube and said filter means allowing flow of filtrate from a test tube into said hollow shaft when said hollow shaft is inserted filter end first into a test tube;

c. a transfer tube means for the transport of liquid from the interior of the hollow shaft to outside the hollow shaft, under pressure from an external pressure source which does not come into direct physical contact with said filtrate, having a first end located within the interior of the

hollow shaft and a second end located outside the hollow shaft; and

d. closure means located in the upper end of the hollow shaft for closing the hollow shaft, said closure means including a fitting for receiving an external air pressure source during transport of liquid from the interior of the hollow shaft to the outside thereof.

4,962,045

TIME-RESOLVED FLUORIMETRIC DETECTION OF LANTHANIDE LABELED NUCLEOTIDES

Enrico G. Picozza, Ridgefield, and Steven S. Saavedra, New Milford, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed May 2, 1988, Ser. No. 188,925

Int. Cl.[5] G01N *33/566*

U.S. Cl. 436—501 **21 Claims**

13. In a method of separating fluorescent labeled nucleotide monomers, oligomers or polymers in a gel electrophoresis system the improvement wherein the fluorescent labeled nucleotide is a lanthanide chelate labeled covalent nucleotide conjugate and no enhancement solution is required for detection.

4,962,046

DISPERSION POLYMERS, AND THEIR USE

Wolfgang Kapmeyer, Marburg, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Filed Apr. 16, 1987, Ser. No. 39,107

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1986, 3613111

Int. Cl.[5] G01N *33/546*

U.S. Cl. 436—533 **8 Claims**

1. A dispersion polymer which contains latex particles having an incompletely polymerized monomer content of 5 to 50% by weight, based on the latex particles, on the surface of said latex particles is a copolymer of a monomer mixture which contains at least one of the compounds of the formula I containing acetal groups.

4,962,047

MIXING AND SEPARATING SOLID PHASE SUPPORTS BY PRESSURE VARIATION

John F. Place, Geneva, Switzerland, assignor to IntraCel Corporation, Bridgetown, Barbados

Filed Oct. 28, 1986, Ser. No. 924,033

Claims priority, application Switzerland, Oct. 30, 1985, 4694/85

Int. Cl.[5] G01N *33/543, 33/537, 33/544;* C12N *11/00*

U.S. Cl. 436—518 **3 Claims**

2. A method of separating a component in liquid phase using a solid-phase support comprising the steps of:

(a) combining gas containing granules of a resiliently compressible material having a volume capable of varying with pressure which have associated an agent for fixing said component, with a liquid phase containing the component;

(b) varying pressure applied to said liquid phase to vary the volume of said granules so as to mix said granules in said liquid phase by changing the density of said granules and thereby fix said component to said granules; and

(c) subsequently varying the pressure applied to said liquid phase to vary the volume of said granules so as to separate said granules from said liquid phase by changing the density of said granules.

4,962,048

MONOCLONAL ANTIBODIES TO HUMAN PANCREATIC CANCER

Shama Kajiji, San Diego, and Vito Quaranta, La Jolla, both of Calif., assignors to Scripps Clinic & Research Foundation, La Jolla, Calif.

Continuation of Ser. No. 16,552, Feb. 19, 1987, abandoned. This application Apr. 3, 1989, Ser. No. 333,848

Int. Cl.[5] G01N *33/53;* C12N *15/00*

U.S. Cl. 436—548 **10 Claims**

1. A monoclonal antibody preparation reactive with the basement membranes surrounding tumor foci at the epithelial stromal interface which has the binding characteristics of S3-41 as set forth in FIG. 3.

4,962,049

PROCESS FOR THE PLASMA TREATMENT OF THE BACKSIDE OF A SEMICONDUCTOR WAFER

Mei Chang, Cupertino, and David Cheng, San Jose, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Apr. 13, 1989, Ser. No. 337,607

Int. Cl.[5] H01L *21/00, 21/02, 21/318, 21/58*

U.S. Cl. 437—13 **20 Claims**

1. A process for treating the back side of a semiconductor wafer which comprises:

(a) supporting a semiconductor wafer a spaced distance from a cathode with the back side of said wafer facing said cathode; and

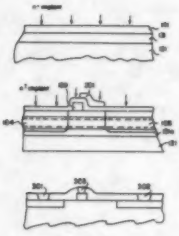
(b) forming a plasma in the gap formed between said cathode and said back side of said wafer to treat said back side of the semiconductor wafer.

4,962,050

GAAS FET MANUFACTURING PROCESS EMPLOYING CHANNEL CONFINING LAYERS

Arthur E. Geissberger; Robert A. Sadler; Gregory E. Menk, and Matthew L. Balzan, all of Roanoke, Va., assignors to ITT Corporation, New York, N.Y.

Filed Dec. 6, 1988, Ser. No. 280,780
Int. Cl.[5] H01L *21/265, 21/44*
U.S. Cl. 437—22 3 Claims



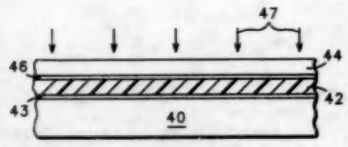
1. A reliably repeatable high volume manufacturing process for high speed GaAs FETs comprising:
providing, by MOCVD, a first undoped layer of AlGaAs on a selected foundation;
providing, by MOCVD, an undoped layer of GaAs on said first layer of AlGaAs;
providing, by MOCVD, a second undoped layer of AlGaAs on said layer of GaAs;
defining a channel region in said layer of GaAs and implanting silicon through said second layer of AlGaAs and into said layer of GaAs;
providing a TiWN layer over said second layer of AlGaAs;
forming an etch mask over said TiWN layer, said etch mask defining a gate pattern;
overetching to provide a gate having a length shorter than the gate length defined by said etch mask;
implanting silicon through said second AlGaAs layer and into said GaAs layer to form source and drain regions employing said etch mask as an implant masking element to self-align said source region with said gate;
providing source and drain electrodes by a process sequence including a heating step to sinter said electrodes at a temperature of between about 800° C. and 850° C., said heating step serving to activate said implanted source, drain and channel regions, whereby separate activation anneals for said implanted regions are not required.

4,962,051

METHOD OF FORMING A DEFECT-FREE SEMICONDUCTOR LAYER ON INSULATOR

H. Ming Liaw, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 18, 1988, Ser. No. 272,977
Int. Cl.[5] H01L *21/265, 21/20*
U.S. Cl. 437—26 5 Claims



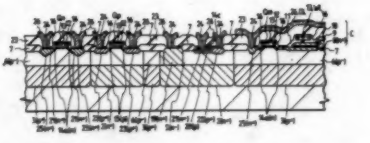
1. A method of fabricating a defect-free semiconductor layer, comprising the steps of:
providing a semiconductor substrate;
forming a strained semiconductor layer on the substrate by adding isoelectronic dopant atoms of a different atomic size than atoms of the semiconductor, which produces misfit dislocations between the semiconductor substrate and the strained semiconductor layer;
forming a semiconductor layer on the strained semiconductor layer which produces misfit dislocations between the strained semiconductor layer and the semiconductor layer; and
implanting oxygen into the strained layer to create a mixed oxide layer which acts as an insulator.

4,962,052

METHOD FOR PRODUCING SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Kyoichiro Asayama, Tachikawa; Hiroyuki Miyazawa, Kodaira; Yutaka Kobayashi, Katsuta, and Seigou Yukutake, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 338,238, Apr. 14, 1989, abandoned.
This application Feb. 7, 1990, Ser. No. 478,050
Claims priority, application Japan, Apr. 15, 1988, 63-91569
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—31 17 Claims



1. A method for manufacturing a semiconductor device including at least one MOSFET and at least one bipolar transistor, comprising the steps of:
(a) providing a semiconductor body having a main surface, said body including a first semiconductor region of a first conductivity type in which a MOSFET is to be formed, and a second semiconductor region of a second conductivity type opposite to said first conductivity type, in which a bipolar transistor is to be formed, in said main surface;
(b) forming a gate electrode of said MOSFET on said first semiconductor region through a gate insulating film;
(c) introducing a first impurity of said second conductivity type into a surface of said first semiconductor region at both sides of said gate electrode, and also introducing simultaneously said first impurity into a surface of said second semiconductor region, whereby there are formed a pair of third semiconductor regions serving as part of source and drain regions of said MOSFET in said first semiconductor region and a fourth semiconductor region in said second semiconductor region;
(d) introducing a second impurity of a higher concentration that than of said fourth semiconductor region, of said first conductivity type, into said second semiconductor region, whereby there is formed a fifth semiconductor region of said first conductivity type serving as a base region of said fourth semiconductor region, so as to overlap with said fourth semiconductor region; and
(e) introducing a third impurity of said second conductivity type having a concentration higher than that of said first impurity into said fifth semiconductor region, whereby there is formed a sixth semiconductor region serving as an emitter region of said bipolar transistor.

4,962,053

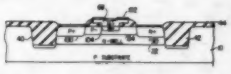
BIPOLAR TRANSISTOR FABRICATION UTILIZING CMOS TECHNIQUES

David Spratt, and Rajiv R. Shah, both of Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 8,906, Jan. 30, 1987, abandoned. This application Jan. 9, 1989, Ser. No. 296,493

Int. Cl.[5] H01L *21/255*

U.S. Cl. 437—31 20 Claims



1. A method of fabricating a bipolar transistor, comprising the steps of:

forming a semiconductor well of a first conductivity type at the face of a semiconductor body;

forming a semiconductor base region of a second conductivity type in said semiconductor well;

forming a polycrystalline silicon emitter structure of said first conductivity type in contact with said semiconductor base region, said emitter structure having sidewalls;

forming a single layer of insulation on said polycrystalline silicon emitter structure and selectively removing said insulation without a mask from planar surfaces to concurrently form single layer sidewall insulation on said sidewalls of said polycrystalline silicon emitter structure;

forming a semiconductor collector region of a first conductivity type in said well contiguously self aligned with respect to said insulation for said emitter structure;

forming a semiconductor extrinsic base region of said second conductivity type in said well and self aligned with respect to said insulation for said emitter structure, and extrinsic base region contiguous with said semiconductor base region; and

providing an impurity of said first conductivity type into said base regions to thereby form a semiconductor emitter region of said first conductivity type.

4,962,054

METHOD FOR MANUFACTURING A FIELD EFFECT TRANSISTOR USING SPACERS OF DIFFERENT THICKNESSES

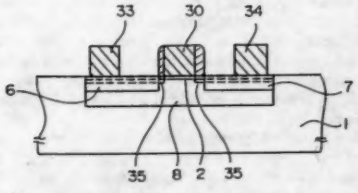
Shin-ichi Shikata, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 27, 1989, Ser. No. 328,880

Claims priority, application Japan, Apr. 11, 1988, 63-88759

Int. Cl.[5] H01L *21/318*

U.S. Cl. 437—40 4 Claims



1. A method for manufacturing a field effect transistor, said method comprising the steps of:

(A) forming a resist pattern corresponding to a gate region on a semiconductor substrate;

(B) depositing an inorganic material on a surface of the substrate by directing the inorganic material from above the substrate onto the substrate surface in a direction oblique to the substrate surface by the use of an electron cyclotron resonance plasma CVD method, said depositing step including a first step of depositing the organic material as the substrate is held in a fixed position, and a second step of further depositing the inorganic material while the substrate is rotated about an axis normal to the surface thereof;

(C) etching to remove the inorganic material from a predetermined region to form inorganic material films having different thicknesses on side walls of the resist pattern;

(D) doping the semiconductor substrate with impurities to a high impurity concentration while using the resist pattern and the inorganic material films on the side walls thereof as a mask to provide a source region and a drain region;

(E) removing the remaining inorganic material films from the substrate;

(F) providing a reversal pattern on the semiconductor substrate by forming an insulative film on the substrate and thereafter removing the resist pattern;

(G) forming a self-alignment gate electrode on the semiconductor substrate in the gate region by using the reversal pattern as a mask;

(H) forming a drain electrode in the drain region; and

(I) forming a source electrode in the source region.

4,962,055

PLASMID, METHOD FOR CONSTRUCTION OF THE SAME, MICROORGANISMS CARRYING THE PLASMID AND METHOD FOR CULTIVATION OF THE MICROORGANISM

Koki Horikoshi; Toshiaki Kudo, both of Tokyo, and Chiaki Kato, Ohmiya, all of Japan, assignors to Rikagaku Kenkyusho, Wako, Japan

Continuation of Ser. No. 587,239, Mar. 7, 1984, abandoned. This application Mar. 30, 1987, Ser. No. 32,032

Claims priority, application Japan, Mar. 8, 1983, 58-38087; Mar. 8, 1983, 58-38089

Int. Cl.[5] C12N *15/00, 1/20*

U.S. Cl. 435—252.8 2 Claims

1. A culture comprising *Escherichia coli* which has been transformed by plasmid pEAP2 and which secretes more than 80% of penicillinase relative to the total cellular production of penicillinase.

4,962,056

METHOD OF MANUFACTURING FROM A SEMICONDUCTOR WAFER A DIELECTRIC SUBSTRATE INCLUDING MUTUALLY INSULATED AND SEPARATED ISLAND REGIONS, AND A METHOD OF MANUFACTURING SEMICONDUCTOR ELEMENTS FROM THE DIELECTRIC SUBSTRATE

Bunshiro Yamaki, Fujisawa, and Nobutaka Matsuoka, Yokohama, both of Japan, assignors to Kabushiki Kaishi Toshiba, Kawasaki, Japan

Filed Jan. 4, 1989, Ser. No. 293,283

Claims priority, application Japan, Jan. 21, 1988, 63-9609

Int. Cl.[5] H01L *21/304, 21/84*

U.S. Cl. 437—62 2 Claims

1. A method of manufacturing a dielectric insulated/-separated substrate from a semiconductor wafer, comprising:

a step of bonding a first monocrystalline semiconductor wafer and a second monocrystalline semiconductor wafer, with a first insulation film being interposed between said first and second wafers;

a step of lapping the first monocrystalline semiconductor wafer by a predetermined thickness;

a mask forming step of forming a mask, having a frame portion with a predetermined width arranged along a peripheral region of the first monocrystalline semiconductor wafer and a grid-like portion arranged within the frame portion, by forming a second insulation film on a surface of the first monocrystalline semiconductor wafer;

a patterning step of exposing, on the basis of said mask forming step, the surface of the first monocrystalline semiconductor wafer in a grid-like manner, with the frame portion and the grid-like portion remaining;

a step of forming separation grooves in a grid-like manner, to such a depth that the separation grooves reach the first insulation film, by etching the surface of the semiconductor wafer exposed in the grid-like manner by said patterning step;

a step of formimg an insulation film on the surfaces of the separation grooves;

a step of forming a polycrystalline semiconductor layer on said remaining frame portion arranged along the peripheral region of the first monocrystalline semiconductor wafer, and on said grid-like portion on the first monocrystalline semiconductor wafer, and further on the insulation film formed on the surfaces of the separation grooves; and

a step of forming a plurality of monocrystalline island regions, into which the wafer is divided by the separation grooves formed in the grid-like manner, by lapping so as to have a predetermined thickness as measured from a reference bottom surface of one of the first and second monocrystalline semiconductor wafers.

4,962,057

METHOD OF IN SITU PHOTO INDUCED EVAPORATION ENHANCEMENT OF COMPOUND THIN FILMS DURING OR AFTER EPITAXIAL GROWTH

John E. Epler, Cupertino, and David W. Treat, San Jose; Thomas L. Paoli, Los Altos, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 13, 1988, Ser. No. 257,498

Int. Cl.[5] H01L *21/20, 21/26*

U.S. Cl. 437—81 **11 Claims**

1. A method of thermal patterning providing sculptured thinning of selected regions in a semiconductor film while in situ during or after its epitaxial growth comprising a compound semiconductor, said method comprising:

maintaining the temperature thereof below that required for initiating thermal evaporation of the constituents comprising said compound semiconductor, said temperature determined in part by the attending ambient surrounding said film,

irradiating said selected regions of said film with a beam having sufficient fluence to thermally elevate the temperature of said selected regions above a crossover point to cause thermal evaporation of said compound semiconductor in said selected regions, and

continuing said beam irradiation continuously or repetitively for a sufficient period of time in said selected regions thereby evaporating said compound semiconductor therein to a desired depth.

4,962,058

PROCESS FOR FABRICATING MULTI-LEVEL INTEGRATED CIRCUIT WIRING STRUCTURE FROM A SINGLE METAL DEPOSIT

John E. Cronin, Milton, and Pei-ing P. Lee, Williston, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 14, 1989, Ser. No. 337,807

Int. Cl.[5] H01L *5/00*

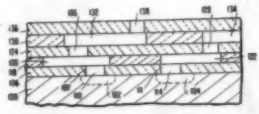
U.S. Cl. 437—187 **4 Claims**

1. A process for forming a multi-level metallization structure on a processed semiconductor substrate, comprising the steps of:

forming a planar insulating layer on said processed semiconductor substrate;

masking and etching said planar insulating layer to form a plurality of wiring troughs in an upper portion of said insulating layer and at least one stud-down via in a lower portion of said insulating layer;

depositing a layer of metal to fill both of said at least one stud-down via and said plurality of wiring troughs, and to form a coating of a thickness X on top of said planar insulating layer;



masking and etching said layer of metal to define at least one stud-up as well as a plurality of interconnection lines, at least one of said plurality of said interconnection lines being defined by said layer of metal within one of said plurality of wiring troughs and by a portion of said layer of metal said portion being of a thickness less than X and at least another one of said plurality of interconnecting lines being defined solely by said layer of metal within one of said plurality of wiring troughs;

so that said stud-down, said plurality of interconnection lines, and said stud-up are all formed from a single layer of metal.

4,962,059

PROCESS FOR FORMING ELECTRODES FOR SEMICONDUCTOR DEVICES USING FOCUSED ION BEAM DEPOSITION

Tadashi Nishioka; Yoji Mashiko; Hiroaki Morimoto, and Hiroshi Koyama, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Division of Ser. No. 118,031, Nov. 9, 1987, Pat. No. 4,853,341. This application Apr. 14, 1989, Ser. No. 338,233

Claims priority, application Japan, Mar. 25, 1987, 62-72211; Jul. 15, 1987, 62-174909

Int. Cl.[5] H01L *21/265, 21/20*

U.S. Cl. 437—189 **65 Claims**

1. A process for forming electrodes for semiconductor devices having a semiconductor substrate and an electrically conductive portion covered and protected by an electrically insulating coating, said process comprising:

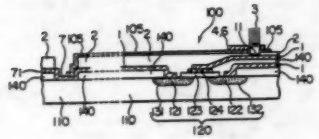
a first step of forming an electrically conductive film on said electrically insulating coating, said electrically conductive film extending from a given position on said electrically insulating coating having the same potential as that at the semiconductor substrate to a position overlying the electrically conductive portion at which said electrode is to be formed

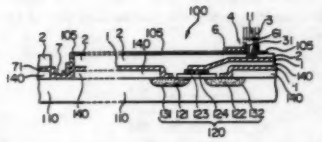
a second step of forming an electrode for connection to an external circuit on a portion of said electrically conductive film overlying said electrically insulating coating, said portion corresponding to a desired position on said electrically conductive portion;

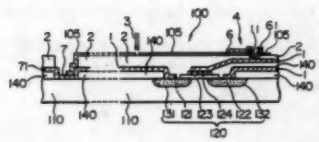
a third step of partially removing said electrode, said electrically conductive film, and said electrically insulating coating to expose a part of said electrically conductive portion on said semiconductor substrate;

a fourth step of electrically connecting said electrode and said part of said electrically conductive portion which is

exposed in said third step by exposing the exposed part of the electrically conductive portion to an ion beam; and







a fifth step of disconnecting said electrode from said given position on the substrate by removing a portion of the extended electrically conductive film.

4,962,060

MAKING A HIGH SPEED INTERCONNECT SYSTEM WITH REFRACTORY NON-DOGBONE CONTACTS AND AN ACTIVE ELECTROMIGRATION SUPPRESSION MECHANISM

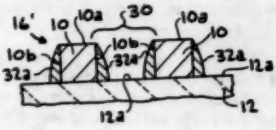
Jack Sliwa, Los Altos Hills; Mohammad Farnaam, Santa Clara; Pankaj Dixit, Sunnyvale, and Lewis N. Shen, Cupertino, all of Calif., assignors to Advanced Micro Devices, Inc., Calif.

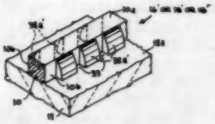
Division of Ser. No. 24,283, Mar. 10, 1987. This application May 2, 1989, Ser. No. 346,050

Int. Cl.[5] H01L *21/44, 21/48*

U.S. Cl. 437—192 **32 Claims**

1. A method of forming an interconnect structure on an integrated circuit formed on a semiconductor substrate having excellent reliability and high speed, comprising forming at least one patterned refractory core portion on an insulating layer, said core portion having a top portion and opposed side portions, said method comprising providing said core portion with sidewall spacers of at least one material selected from the group consisting of aluminum, gold and copper and alloys





thereof, thereby affording lateral cladding of said refractory core portions, and exposing said top portion thereof.

4,962,061

METHOD FOR MANUFACTURING A MULTILAYER WIRING STRUCTURE EMPLOYING METAL FILLETS AT STEP PORTIONS

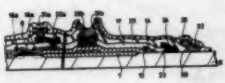
Yoshifumi Takata, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

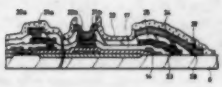
Filed Feb. 10, 1989, Ser. No. 308,622

Claims priority, application Japan, Feb. 12, 1988, 63-31200; Dec. 9, 1988, 63-312666

Int. Cl.[5] H01L *21/283, 21/60*

U.S. Cl. 437—195 **9 Claims**





1. A method for manufacturing a semiconductor integrated circuit device comprising the steps of:

preparing a semiconductor substrate on which a scribe line portion is to be formed;

forming a first interlayer insulating film on said semiconductor substrate, said interlayer having an exposed surface;

etching away said first interlayer insulating film at said scribe line portion so as to expose the scribe line portion of said semiconductor substrate;

a step portion comprising an edge of said first interlayer insulating film being formed at said scribe line portion by etching said first interlayer insulating film;

forming a first metal wiring film on the whole surface of said semiconductor substrate comprising said exposed surface

and said edge of said first interlayer insulating film after etching said first interlayer insulating film; and

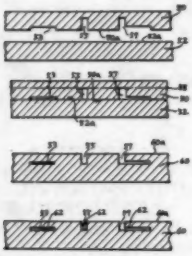
etching away said first metal wiring film; said step of etching said first interlayer metal wiring film being performed such that a portion of residue of said first metal wiring film may be left so as to cover the edge and an adjoining portion of the exposed surface of said first interlayer insulating film along the step portion in said scribe line portion.

4,962,062

METHOD OF TIGHTLY JOINING TWO SEMICONDUCTOR SUBSTRATES

Makoto Uchiyama, Zushi, and Hidetoshi Nojiri, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 31, 1988, Ser. No. 238,421
Claims priority, application Japan, Sep. 11, 1987, 62-226262
Int. Cl.[5] H01L *21/76*
U.S. Cl. 437—225 **10 Claims**



1. A method of joining two semiconductor substrates, comprising the steps of:

providing two semiconductor substrates, each of which has a flat and polished surface;

forming at least one groove in said polished surface of at least one of said two semiconductor substrates;

wetting the polished surface of at least one of the two substrates with a liquid not containing any solute which causes precipitation of a solid substance when the liquid evaporates;

placing one of the two substrates on the other so as to bring said surfaces of the respective substrates into contact with each other, with a thin film of said liquid therebetween to provisionally join the two substrates;

subjecting the two substrates in the provisionally joined state to a heat treatment at a temperature lower than the melting temperature of the material of the semiconductor substrates; and

forming a dielectric layer in said at least one groove, the dielectric layer being an organic polymer layer.

4,962,063

MULTISTEP PLANARIZED CHEMICAL VAPOR DEPOSITION PROCESS WITH THE USE OF LOW MELTING INORGANIC MATERIAL FOR FLOWING WHILE DEPOSITING

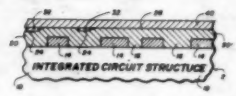
Dan Maydan, Los Altos Hills, and David N. Wang, Saratoga, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 269,508, Nov. 10, 1988. This application Mar. 10, 1989, Ser. No. 321,943
Int. Cl.[5] H01L *21/461*
U.S. Cl. 437—228 **21 Claims**

1. A process for planarization of an integrated circuit structure in a vacuum apparatus, said structure having portions on the surface thereof higher than adjacent portion of the surface which comprises;

(a) depositing a conformal insulation layer over said substrate using an ECR plasma deposition;

(b) depositing a low melting inorganic planarization layer over said conformal insulation layer at a deposition temperature within a range of from about 100° C. to about 700° C. and sufficiently high within said range to permit said low melting inorganic planarizing layer to flow as it is deposited; and



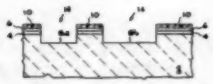
(c) etching said planarization layer to planarize said integrated circuit structure.

4,962,064

METHOD OF PLANARIZATION OF TOPOLOGIES IN INTEGRATED CIRCUIT STRUCTURES

Jacob D. Haskell, Palo Alto; Craig S. Sander, Mountain View; Steven C. Avanzino, Cupertino, and Subhash Gupta, San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed May 12, 1988, Ser. No. 193,478
Int. Cl.[5] H01L *21/465*
U.S. Cl. 437—228 **31 Claims**



1. A method of making a highly planarized integrated circuit structure having highly planarized oxide portions using deposited oxide and a polysilicon planarizing material to planarize said deposited oxide by respectively polishing said polysilicon planarizing material and etching said oxide which comprises:

(a) depositing over an integrated circuit structure having first portions at a height higher than the remainder of said integrated circuit structure, a conformal oxide layer having a thickness which exceeds the height of said first portions above the remainder of said substrate;

(b) depositing a layer of a polysilicon planarizing material over said deposited conformal oxide layer;

(c) polishing said structure to remove portions of said polysilicon planarizing material until the highest portions of said underlying conformal oxide layer are exposed;

(d) etching said exposed highest portions of said conformal oxide layer on said integrated circuit structure in a first etching step with an etchant system capable of removing said conformal oxide layer selectively with respect to said layer of polysilicon planarizing material to remove a portion of said exposed conformal oxide layer;

(e) polishing said structure again to remove the remainder of said polysilicon planarizing material; and

(f) etching the remainder of said structure in a second etching step until all of said deposited conformal oxide over said first portions of said integrated circuit structure is removed leaving a highly planarized structure having oxide regions formed therein between said first portions of said integrated circuit structure with the upper surface of said oxide regions substantially level with the upper sur-

face of said first portions of said integrated circuit structure.

15. A method of making a highly planarized integrated circuit structure having field oxide regions formed therein between active regions of a substrate using a deposited layer of conformal oxide and a polysilicon planarizing layer, and respectively polishing said polysilicon planarizing layer and etching said conformal oxide layer which comprises:

(a) patterning a silicon substrate with a mask having openings therein conforming to desired formation of field oxide regions in said substrate;

(b) etching said silicon substrate through said mask to a depth of from about 0.45 microns to about 0.55 microns;

(c) removing said mask;

(d) depositing from about 7000 to about 9000 Angstroms of a conformal oxide layer over said structure;

(e) depositing over said conformal oxide layer a layer of a polysilicon planarizing material;

(f) mechanically polishing said structure a first time to remove portions of said polysilicon planarizing layer until the highest portions of said underlying conformal oxide layer are exposed;

(g) selectively etching said exposed highest portions of said conformal oxide layer on said integrated circuit structure a first time with an etchant system capable of removing said deposited conformal oxide and said layer of polysilicon planarizing material at an oxide:planarizing material removal rate of at least about 8:1 until about 0.5 microns of said exposed conformal oxide layer has been removed;

(h) polishing said structure a second time to remove substantially all of said polysilicon planarizing material left on said structure after said first etching step; and

(i) etching said structure a second time with an etchant system capable of removing any remaining portions of said polysilicon planarizing material at about the same rate as said oxide until all of said planarizing material is removed; and

(j) etching the remainder of said structure with an etchant which will etch oxide at a faster rate than silicon until all of said conformal oxide over said active regions is removed leaving a highly planarized structure having field oxide regions formed therein between active regions in the substrate with the upper surface of the field oxide regions substantially level with the surface of the active regions.

4,962,065

ANNEALING PROCESS TO STABILIZE PECVD SILICON NITRIDE FOR APPLICATION AS THE GATE DIELECTRIC IN MOS DEVICES

William D. Brown, Fayetteville, Ark., and Muhammad A. Khaliq, Mankato, Minn., assignors to The University of Arkansas, Little Rock, Ark.

Continuation of Ser. No. 309,113, Feb. 13, 1989, abandoned. This application Feb. 9, 1990, Ser. No. 478,028

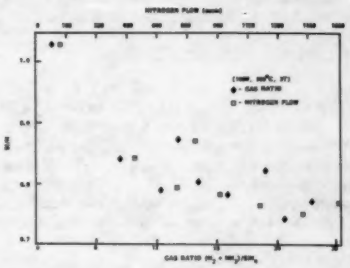
Int. Cl.[5] H01L *21/318*

U.S. Cl. 437—242 **15 Claims**

1. In a method, the steps of:

(a) depositing a layer of silicon nitride on a substrate by means of plasma enhanced chemical vapor deposition techniques; and

(b) rapid thermal annealing the silicon nitride layer within a temperature range and a time period range sufficient to increase an N—H bond concentration of the silicon nitride to produce a layer of silicon nitride that is stable with



respect to charge transfer hysteresis between the silicon nitride and the substrate.

4,962,066

SOLDER PASTE FOR FASTENING SEMICONDUCTORS ONTO CERAMIC BASES

Karl-Anton Starz, Rodenbach; Mathias Metzner, Kleinostheim, and Wolfgang Weber, Karlstein, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 21, 1990, Ser. No. 483,219

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1989, 3905276

Int. Cl.[5] C03C *8/18*

U.S. Cl. 501—19 **3 Claims**

1. A solder paste for fastening semiconductors onto ceramic bases at a temperature below 380° C., consisting essentially of (1) 75 to 90% by weight of a mixture of silver powder and (2) a low-melting glass powder with the weight ratio of silver to glass being between 2:1 and 9:1 and (2) 10 to 25% by weight of an organic solvent which contains 1 to 10% by weight of a thermally readily decomposable resin, the glass powder consisting essentially of

75 to 85% by weight lead oxide
8 to 15% by weight boron oxide
0.5 to 10% by weight silver (I) oxide
0.5 to 10% by weight bismuth (III oxide
0 to 5% by weight silicon dioxide
0 to 2% by weight aluminum oxide
0 to 2% by weight tin dioxide
0 to 2% by weight zinc oxide

and having a glass transition temperature (Tg) of 250° to 300° C.

4,962,067

ERBIUM LASER GLASS COMPOSITIONS

John D. Myers, Hilton Head Island, S.C., assignor to Kigre, Inc., Hilton Head Island, S.C.

Filed Jul. 14, 1989, Ser. No. 379,990

The portion of the term of this patent subsequent to Sep. 13, 2006, has been disclaimed.

Int. Cl.[5] C03C *3/16*

U.S. Cl. 501—45 **14 Claims**

1. A phosphate laser glass composition comprising:

approximately 50 to approximately 65 mole percent P_2O_5;

approximately 10 to approximately 30 mole percent R_2O, where R_2O is selected from the group consisting of Li_2O, Na_2O, K_2O, Rb_2O, Cs_2O and combinations thereof;

approximately 5 to approximately 25 percent MO, where MO is selected from the group consisting of MgO, CaO, SrO, BaO, ZnO and combinations thereof;

up to approximately 10 mole percent Al_2O_3;

up to approximately 1 mole percent Nb_2O_5;

up to approximately 0.5 mole percent Sb_2O_3;
up to approximately 4 mole percent CeO_2;
approximately 0.01 to approximately 0.15 mole percent Er_2O_3;
up to approximately 0.2 mole percent Nd_2O_3; and
approximately 0.1 mole percent to the limit of solubility Yb_2O_3.

4,962,068

OXIDE GLASSES HAVING LOW GLASS TRANSFORMATION TEMPERATURES

John Wing-Keung Lau, Gaithersburg, Md., and Anastasia M. Conlon, So. Easton, Mass., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Division of Ser. No. 235,066, Aug. 22, 1988, Pat. No. 4,904,415. This application Dec. 4, 1989, Ser. No. 466,086
Int. Cl.[5] C03C *3/14*
U.S. Cl. 501—49 10 Claims

1. A glass composition having a glass transformation temperature below about 300° C., comprising PbO, B_2O_3, and Ag_2O in a respective weight ratio of 76–88:10–15:2–10.

4,962,069

HIGHLY DENSIFIED BODIES FROM PRECERAMIC POLYSILAZANES FILLED WITH SILICON CARBIDE POWDERS

Gary T. Burns; Chandan K. Saha, both of Midland, Mich., and Ronald J. Keller, Solon, Ohio, assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 7, 1988, Ser. No. 268,398
Int. Cl.[5] C04B *35/52*
U.S. Cl. 501—90 48 Claims

1. A method of preparing a sintered body of silicon carbide, said method comprising

(a) forming a handleable green body by

(i) preparing an intimate mixture comprising silicon carbide powder, a metal-containing sintering aid, and a preceramic polysilazane, where the metal-containing sintering aid is present at 0.1 to 3.0 weight percent of the metal based on the weight of silicon carbide powder and where the preceramic polysilazane is present at such a level that the free carbon value of the mixture is greater than 0.4 weight percent based on the total weight of the silicon carbide powder and the char derived from the preceramic polysilazane and

(ii) then forming the intimate mixture into the desired shape under pressure at a temperature less than about 500° C. to obtain a handleable green body; and

(b) sintering the handleable green body in an inert atmosphere at a temperature greater than 2000° C. to obtain a sintered body of silicon carbide with a density greater than 2.4 g/cm^3.

4,962,070

NON-POROUS METAL-OXIDE COATED CARBONACEOUS FIBERS AND APPLICATIONS IN CERAMIC MATRICES

Thomas M. Sullivan, 3953 Oregon St., San Diego, Calif 92104

Continuation-in-part of Ser. No. 793,274, Oct. 1, 1985, abandoned. This application Nov. 25, 1987, Ser. No. 125,221
Int. Cl.[5] C04B *35/80, 35/84*
U.S. Cl. 501—95 7 Claims

1. A ceramic matrix composite capable of withstanding chemical degradation at temperatures greater than 1600° C., comprising:

metal oxide-coated carbonaceous fibers, and

ceramic matrix material in contact with said metal oxide-coated carbonaceous fibers wherein said metal oxide-coated carbonaceous fibers occupy from greater than 0% up to about 55% by volume of said ceramic matrix composite.

4,962,071

METHOD OF FABRICATING A SINTERED BODY OF INDIUM TIN OXIDE

Michel L. Bayard, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed May 1, 1989, Ser. No. 346,429
Int. Cl.[5] C04B *35/50*
U.S. Cl. 501—134 15 Claims

1. A method of fabricating a sintered body of indium tin oxide, comprising:

(a) forming a finely divided mixture of In_2O_3, SnO_2, an effective amount of an oxide of a trivalent material other than indium and an effective amount of an oxide of a tetravalent material other than tin, the oxide of said trivalent material and the oxide of said tetravalent material forming, on heating, a compound that acts as a sintering agent with respect to indium tin oxide,

(b) compacting the mixture, and

(c) heating the mixture to a sintering temperature.

4,962,072

PRESSURE SENSITIVE RECORD MATERIAL

John B. Cooper, Stokenchurch, and Kevin J. Clay, Perivale, both of England, assignors to The Wiggins Teape Group Limited, Basingstoke, Great Britain

PCT No. PCT/GB87/00910, § 371 Date Jan. 13, 1989, § 102(e) Date Jan. 13, 1989, PCT Pub. No. WO88/04614, PCT Pub. Date Jun. 30, 1988
PCT Filed Dec. 17, 1987, Ser. No. 299,961
Claims priority, application United Kingdom, Dec. 18, 1986, 8630231
Int. Cl.[5] B41M *5/22*
U.S. Cl. 503—200 32 Claims

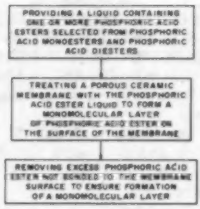
1. A record material comprising a paper sheet having on its front a printable pigment coating and on its back isolated droplets of color former solution each confined within a pressure rupturable barrier, wherein the pigment coating comprises (a) a pigment, (b) a binder for the pigment and (c) at least one of (i) a sizing agent and (ii) a coating structure agent.

4,962,073

SURFACE TREATED POROUS CERAMIC MEMBRANES AND METHOD OF MAKING SAME

Edward S. Martin, New Kensington, and Larry F. Wieserman, Apollo, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 23,312, Mar. 9, 1987, Pat. No. 4,871,711, which is a continuation-in-part of Ser. No. 946,870, Dec. 29, 1986, abandoned. This application Oct. 31, 1988, Ser. No. 265,243
The portion of the term of this patent subsequent to Oct. 3, 2006, has been disclaimed.
Int. Cl.[5] B01D *71/06, 71/02;* B01J *20/28, 20/22*
U.S. Cl. 502—4 23 Claims


PROVIDING A LIQUID CONTAINING ONE OR MORE PHOSPHONIC ACID ESTERS SELECTED FROM PHOSPHONIC ACID MONOESTERS AND PHOSPHONIC ACID DIESTERS
TREATING A POROUS CERAMIC MEMBRANE WITH THE PHOSPHONIC ACID ESTER LIQUID TO FORM A MONOMOLECULAR LAYER OF PHOSPHONIC ACID ESTER ON THE SURFACE OF THE MEMBRANE
REMOVING EXCESS PHOSPHONIC ACID ESTER NOT BONDED TO THE MEMBRANE SURFACE TO ENSURE FORMATION OF A MONOMOLECULAR LAYER

1. A treated permeable inorganic membrane having a metal oxide/hydroxide surface and having bonded thereto a substantially monomolecular layer of phosphoric acid ester material, and the bond formed between the oxide or hydroxide group on

the membrane and the acid group on the phosphoric acid ester, the ester material selected from the class consisting of:

(a) one or more phosphoric acid monoesters having the formula $(RO)PO(OH)_2$;

(b) one or more phosphoric acid diesters having the formula (RO) (R'O)PO(OH); and

(c) mixtures of same; where R comprises a 1-30 carbon-containing group and R' comprises hydrogen or a 1-30 carbon-containing group.

4,962,074

CATALYTIC CRACKING OF HYDROCARBONS WITH OXYGEN PROMOTED ALKALI METAL ZEOLITE CRACKING CATALYST

Nai Y. Chen, Titusville, N.J., and Thomas F. Degnan, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 2, 1989, Ser. No. 360,501
Int. Cl.[5] B01J *29/06*
U.S. Cl. 502—67 11 Claims

1. A catalytic cracking catalyst comprising a large pore alkali metal zeolite and a shape selective zeolite additive having a Constraint Index of 1-12 and a silica:alumina ratio in excess of 12, said cracking catalyst being essentially free of shape selective combustion catalyst.

4,962,075

ZEOLITIC COPPER CATALYST

Gary J. Green, Yardley, Pa., and David S. Shihabi, Pennington, N.J., assignors to Mobil Oil Corp., New York, N.Y.

Filed Dec. 5, 1988, Ser. No. 279,613
Int. Cl.[5] B01J *29/30, 29/20, 29/10*
U.S. Cl. 502—71 14 Claims

8. A zeolitic copper catalyst having enhanced resistance to loss of activity on exposure to steam at high temperature, said catalyst comprising a crystalline zeolite incorporated in a silica-alumina or an alumina binder, with said zeolite having in the dehydrated state the composition in terms of mole ratio of oxides:

$$0.03\text{-}2.0\ CuO{:}0\text{-}0.9\ M_{2/n}O{:}Al_2O_3{:}20\text{-}100\ SiO_2{:}bXO_2$$

wherein M is at least one cation other than a copper cation and having a valence of "n", and bXO_2 is a steam stabilizing amount of an inorganic titanium or zirconium compound or a mixture thereof, said crystalline zeolite having the crystal structure of ZSM-5, ZSM-11, ZSM-12, ZSM-22, ZSM-23, ZSM-35, ZSM-38, ZSM-48, mordenite, dealuminated Y or Zeolite Beta.

4,962,076

SILICONE SEALANTS HAVING REDUCED COLOR

Hsien-Kun Chu; Russell P. Kamis, both of Midland; Jerome M. Klosowski, Bay City, and Loren D. Lower, Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 276,977, Nov. 28, 1988, Pat. No. 4,906,719.
This application Oct. 6, 1989, Ser. No. 418,074
Int. Cl.[5] B01J *31/22*
U.S. Cl. 502—158 5 Claims

1. A composition comprising a chelated titanium catalyst, of the type known to be useful in catalyzing the cure of alkoxy endblocked polydiorganosiloxane in the presence of moisture, and an additive selected from the group consisting of organomercaptan of the formula RSH, where R is a hydrocarbon radical containing from 3 to 12 carbon atoms, and mercapto containing silane of the formula $HSR'SiX_3$, where R' is a divalent hydrocarbon having from 1 to 8 carbon atoms and X is alkoxy radical having 1 to 6 carbon atoms.

4,962,077

TRANSITION METAL TRIS-DITHIOLENE AND RELATED COMPLEXES AS PRECURSORS TO ACTIVE CATALYSTS

Thomas R. Halbert, Annandale; Russell R. Chianelli, Somerville; Edward I. Stiefel, Bridgewater, and Allan J. Jacobson, Princeton, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jul. 11, 1989, Ser. No. 378,565
Int. Cl.[5] B01J *27/04, 27/047*
U.S. Cl. 502—220 9 Claims

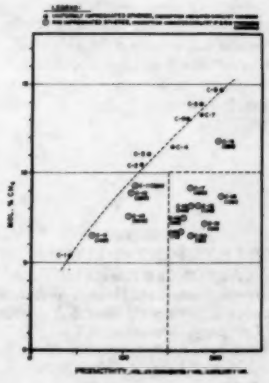
1. A catalyst formed by heating a precursor containing a transition metal complex represented by the formula $ML^n{}_3$ wherein M is a transition metal selected from the group consisting of Mo, W, Re and mixtures thereof, n represents the total charge of the metal complex and is 0, −1, or −2, and L is ligand selected from the group consisting of dithiolates and aminobenzenethiolates, said heating being conducted in a reducing atmosphere at a temperature in excess of about 200° C. and for a time sufficient to form said catalyst.

4,962,078

COBALT-TITANIA CATALYSTS, PROCESS UTILIZING THESE CATALYSTS FOR THE PREPARATION OF HYDROCARBONS FROM SYNTHESIS GAS, AND PROCESS FOR THE PREPARATION OF SAID CATALYSTS

William C. Behrmann; Charles H. Mauldin, and Kym B. Arcuri, all of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 46,649, May 7, 1987, abandoned. This application Oct. 3, 1988, Ser. No. 252,215
Int. Cl.[5] B01J *21/06, 23/84, 23/74;* C07C *1/04*
U.S. Cl. 502—325 14 Claims



1. A catalyst composition useful for the conversion of synthesis gas to liquid hydrocarbons which comprises cobalt dispersed and impregnated as a catalytically active layer upon the surface of a support, the support being at least about 80% by weight titania, the layer ranging in average thickness from about 0.2 mm to about 0.20 mm with the cobalt loading being about 0.04 g/cc to about 0.15 g/cc, calculated as metallic cobalt per packed bulk volume of catalysts, and having a productivity and methane selectivity at 200° C. of at least 150 hr^{-1} and no more than 10 mole %, respectively.

4,962,079

OVERCOATED HEAT-SENSITIVE RECORD MATERIALS

Hisashi Matsumoto, Kobe; Masaaki Takami, deceased, late of Kakogawa (by Harumi Takami, legal representative); Nobuyuki Takahashi, Sakai, and Tetsuya Inoue, Osaka, all of Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo and Arakawa Chemical Industries, Ltd., Osaka, both of, Japan

Filed Dec. 19, 1988, Ser. No. 286,048
Claims priority, application Japan, Dec. 25, 1987, 62-330611
Int. Cl.[5] B41M *5/18*
U.S. Cl. 503—226 7 Claims

1. A heat-sensitive record material which comprises a substrate, a heat-sensitive layer bonded to the substrate and an overcoat layer of an overcoat composition coating the surface of the heat-sensitive layer, said overcoat composition comprising as an effective component thereof an emulsion of graft copolymer prepared by graft-copolymerizing methyl (meth)acrylate (A), a lower hydroxyalkyl (meth)acrylate (D) and (meth)acrylic acid (C) with a polyvinyl alcohol in the presence of water and a neutralization salt of diisobutylene-maleic anhydride copolymer.

4,962,080

IMAGE-RECEIVING SHEET FOR THERMAL DYE-TRANSFER RECORDING

Kazuo Watanabe, Hyogo, Japan, assignor to Kanzaki Paper MFG. Co., Ltd., Tokyo, Japan

Filed Mar. 6, 1989, Ser. No. 319,203
Claims priority, application Japan, Mar. 8, 1988, 63-55451; Nov. 2, 1988, 63-278176
Int. Cl.[5] B41M *5/035, 5/26*
U.S. Cl. 503—227 20 Claims

1. An image-receiving sheet for thermal dye-transfer recording, which comprises a support having thereon an image-receiving layer for receiving a transferred image from a coloring material-transferring sheet, wherein said image-receiving layer is an image-receiving layer formed by coating an aqueous coating composition comprising a dyeable resin, an alcoholic hydroxyl group-containing alcohol-modified silicone oil, and colloidal silica and/or an aqueous crosslinking agent in an aqueous medium, followed by drying.

4,962,081

COLOR FILTER ARRAY ELEMENT WITH POLYCARBONATE RECEIVING LAYER

Daniel J. Harrison, Rochester; Helmut Weber, Webster, and Paul D. Yacobucci, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 6, 1989, Ser. No. 334,269
Int. Cl.[5] B41M *5/035, 5/26*
U.S. Cl. 503—227 20 Claims

12. A process of forming a color filter array element comprising

(a) imagewise-heating a dye donor element comprising a support having thereon a dye layer, and

(b) transferring a dye layer to a dye-receiving element comprising a transparent support having thereon a polycarbonate binder having a T_g greater than about 200° C.,

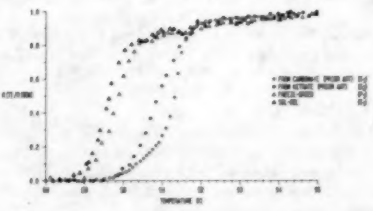
said imagewise-heating being done in such a way as to produce a repeating mosaic pattern of colorants to form said color filter array element.

4,962,082

METHOD OF MAKING HIGH TC OXIDE SUPERCONDUCTOR PARTICLES BY ADJUSTING PH VALUE AND CATIONIC RATIO OF ADMIXED SOLUTION FOLLOWED BY DRYING, HEATING AND FIRMING

Philippe Barboux, Eatontown, and Jean-Marie Tarascon, Millington, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Nov. 19, 1987, Ser. No. 122,460
Int. Cl.[5] C01F *11/04, 17/00*
U.S. Cl. 505—001 5 Claims



1. Method for the preparation of superconducting compositions of the formula $MBa_2Cu_3O_{7-y}$ wherein M represents yttrium and the rare earth elements and y is an integer ranging from 0.1 to 0.8 which comprises the steps of

a. preparing a barium solution in acetic acid,

b. adding the solution to a mixture of copper acetate and a rare earth nitrate,

c. increasing the pH of the resultant solution to a value at which the rare earth and copper hydroxides are formed,

d. forming a viscous gel solution,

e. freeze drying the gel to yield a powder which is heated slowly to a temperature of approximately 600° C. to yield a crystalline resistive phase, and

f. heating said resistive phase in oxygen at a temperature within the range of 750–950° C. to yield a superconducting single phase perovskite.

4,962,083

HIGH TEMPERATURE T1-BA-CA-CU-O AND T1-SR-CU-O SUPERCONDUCTOR

Allen M. Hermann, and Zhengzhi Sheng, both of Fayetteville, Ark., assignors to University of Arkansas, Fayetteville, Ark.

Filed Feb. 12, 1988, Ser. No. 155,247
Int. Cl.[5] C01F *11/02*; C01G *3/02, 15/00*
U.S. Cl. 505—1 8 Claims

1. A composition having superconductor properties that has the following approximate stoichiometry:

$$TlCa_yBa_zCu_yO_x$$

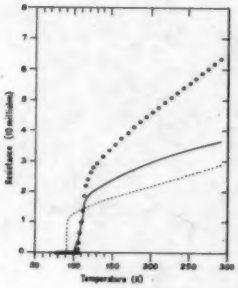
wherein:

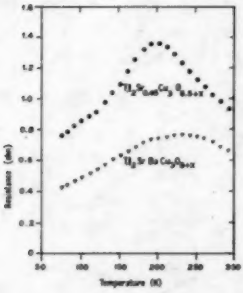
y+z is greater than or equal to 0.2 and less than or equal to 5;

z is greater than 0 and less than 5;

y is greater than 0 and less than 5;

u is greater than or equal to 0.5 and less than or equal to 15; and





v is greater than or equal to z+y+u and less than or equal to 2+z+y+u.

4,962,084

PRODUCTION OF OXIDIC SUPERCONDUCTOR PRECURSORS

John J. deBarbadillo, II, Barboursville, and Gaylord D. Smith, Huntington, both of W. Va., assignors to INCO Alloys International, Inc., Huntington, W. Va.

Filed Apr. 12, 1988, Ser. No. 180,374

Int. Cl.[5] H01L *39/12, 5/08, 39/24*

U.S. Cl. 419—19 **7 Claims**

1. A process for production of a metallic precursor of an oxidic superconductor comprising mechanical alloying powders containing the metallic elemental components of said oxidic superconductor in the presence of a process control agent non-detrimental to said oxidic superconductor, said metallic elemental components being in the proportion relative to each other required in said oxidic superconductor, compacting and working the product of said mechanical alloying to provide a metal precursor alloy adaptable for forming to a required superconductor configuration.

4,962,085

PRODUCTION OF OXIDIC SUPERCONDUCTORS BY ZONE OXIDATION OF A PRECURSOR ALLOY

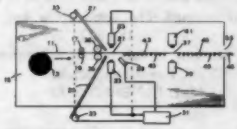
John J. deBarbadillo, II, Barboursville, and Gaylord D. Smith, Huntington, both of W. Va., assignors to Inco Alloys International, Inc., Huntington, W. Va.

Filed Apr. 12, 1988, Ser. No. 180,375

Int. Cl.[5] H01L *39/12;* **C01F** *17/00;* **C01G** *3/02;* **C22C** *29/12*

U.S. Cl. 505—1 **11 Claims**

1. A process for producing an oxidic superconductor comprising exposing an elongated body of metallic oxidic superconductor precursor alloy to at least one oxidation zone of limited dimension, initiating and continuing oxidation in said at least one zone in the presence of an oxidizing gas to thereby at least partly oxidize said precursor alloy and establish oxidic



crystal format and causing substantially continuous relative motion between said precursor alloy and said at least one zone to provide on one side of said at least one zone unoxidized metal and on the other side of said at least one zone textured, elongated oxidic crystals.

4,962,086

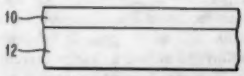
HIGH T_c SUPERCONDUCTOR - GALLATE CRYSTAL STRUCTURES

William J. Gallagher, Ardsley; Edward A. Giess, Purdys; Aranava Gupta, Valley Cottage; Robert B. Laibowitz; Eugene J. O'Sullivan, both of Peekskill, and Robert L. Sandstrom, Chappaqua, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 8, 1988, Ser. No. 204,066

Int. Cl.[5] B32B *9/00*

U.S. Cl. 505—1 **29 Claims**



1. A superconductive combination, including:

a crystalline gallate layer, including a rare earth element or another element selected from the group consisting of Y, La, Bi, and Sc, or combinations of a rare earth element and at least one of said another elements.

a superconductive layer thereon, said superconductive layer having a transistion temperature in excess of 77° K. and being an oxide material having Cu-O planes whose Cu and O atoms align with Ga and O atoms in said gallate layer.

4,962,087

EPITAXIAL SUPERCONDUCTING SCRUCTURE ON LATTICE MATCHED LANTHANUM ORTHOGALLATE

Roger F. Belt, Morristown, and Robert Uhrin, Brookside, both of N.J., assignors to Litton Systems, Inc., Morris Plains, N.J.

Filed Mar. 4, 1988, Ser. No. 164,101

Int. Cl.[5] C30B *7/10, 29/22*

U.S. Cl. 505—1 **10 Claims**

1. In a superconducting device comprising a high Tc superconducting thin film of metal oxide based perovskite deposited on a crystalline substrate, the improvement which comprises providing as the crystalline substrate of said device (1) monocrystalline lanthanum orthogallate grown from a pure melt of lanthanum and gallium oxides while controlling the major crystallographic direction of solidification or (2) a mixed single crystal of lanthanum orthogallate grown from a melt of lanthanum, gallium and additive oxides while controlling the major crystallographic direction of solidification.

4,962,088

FORMATION OF FILM SUPERCONDUCTORS BY METALLO-ORGANIC DEPOSITION

Adolph L. Micheli; Dennis F. Dungan, both of Mt. Clemens; Aboud H. Hamdi, Detroit; Joseph V. Mantese, Washington, and Ruth Carol O. Laugal, Union Lake, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 136,770, Dec. 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 103,245, Sep. 30, 1987, abandoned. This application Apr. 27, 1988, Ser. No. 186,627

The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.

Int. Cl.[5] B05D *5/12*

U.S. Cl. 505—1 **2 Claims**

2. A method for producing thin film superconductor materials comprising the steps of:

forming a solution from the neodecanoates of yttrium, barium, and copper metals, said metals form an oxide mixture exhibiting superconductive properties, said oxide mixture characterized by a ratio of approximately 1:2:4 for said yttrium, barium and copper metals respectively, said solution comprises a solvent having at least approximately 5 volume percent pyridine in xylene;

depositing a film of said solution onto a substrate, said substrate selected from the group consisting of strontium titanate, barium titanate, and sapphire;

pyrolyzing said film in an oxygen-containing environment at a first temperature of about 500° C. for about 5 minutes, so as to decompose said neodecanoates of yttrium, barium, and copper into a film containing oxides of yttrium, barium, and copper, said pyrolyzing occurring substantially immediately after said depositing step; and

heating said metal oxide film to a second temperature of about 850° C. for a duration of approximately no more than 2 minutes and allowing said metal oxide film to cool to room temperature, then heating said metal oxide film to a third temperature of about 920° C. for a duration of approximately no more than 1 minutes so as to promote recrystallation and grain growth of said metal oxides within said film and induce a change therein by which said film exhibits superconducting properties at a significantly increased temperature.

4,962,089

CYANO-SUBSTITUTED SULFUR-CONTAINING COMPOUNDS, AND COMPOSITIONS CONTAINING SAME AND ORGANOLEPTIC USES THEREOF

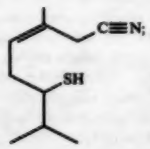
Richard M. Boden, Ocean, and Joseph A. McGhie, South Orange, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 273,016, Nov. 18, 1988, Pat. No. 4,883,884. This application Oct. 20, 1989, Ser. No. 424,601

Int. Cl.[5] C07C *255/07*; A23L *2/26*; A61K *7/46*

U.S. Cl. 512—6 **4 Claims**

1. A cyano-substituted sulfur-containing compound defined according to a structure selected from the group consisting of:



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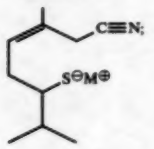
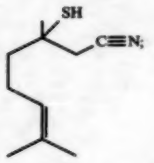
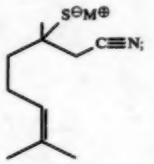
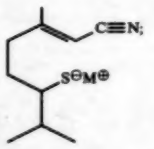
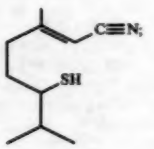
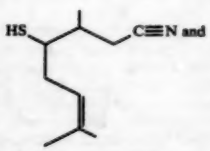


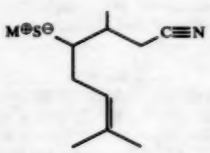












wherein M is an alkali metal.

3. A process for augmenting or enhancing the aroma or taste of a consumable material comprising the step of adding to said consumable material, an aroma or taste augmenting or enhancing quantity of the product defined according to claim 1.

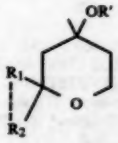
4,962,090

2,4-DISUBSTITUTED AND 2,2,4-TRISUBSTITUTED TETRAHYDROPYRANYL-4-ETHERS, PROCESS FOR PREPARING SAME AND PERFUMERY USES THEREOF

Mark A. Sprecker, Sea Bright; Robert P. Belko, Woodbridge; Salvatore M. Brucato, Carteret; Charles E. J. Beck, Summit, and Marie R. Hanna, Keyport, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Mar. 22, 1990, Ser. No. 497,593
Int. Cl.[5] A61K 7/46
U.S. Cl. 512—9 50 Claims

1. At least one 2,4-disubstituted or 2,2,4-trisubstituted tetrahydropyranyl-pyranyl-4-ether defined according to the structure:



wherein R' is selected from the group consisting of methyl and ethyl and R_1 and R_2 taken alone are the same or different hydrogen, phenyl, C_1–C_8 alkyl or C_2–C_8 alkenyl, with the proviso that R_1 and R_2 are not both hydrogen, and R_1 and R_2 taken together represent a C_5–C_{12} cycloalkyl or alkyl cycloalkyl moiety.

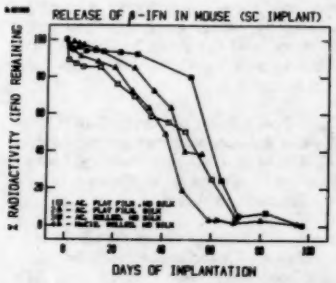
23. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, perfumed articles and perfumed polymers comprising the step of intimately admixing with said consumable material, an aroma augmenting or enhancing quantity of at least one compound defined according to claim 1.

4,962,091

CONTROLLED RELEASE OF MACROMOLECULAR POLYPEPTIDES

Deborah A. Eppstein, Palo Alto, and Brian B. Schryver, Redwood City, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed May 23, 1986, Ser. No. 866,625
Int. Cl.[5] A61K 31/12, 47/00
U.S. Cl. 514—2 42 Claims



1. A composition for the controlled administration of a biologically active macromolecular polypeptide comprising (a) a polylactide matrix in which is incorporated a micro-suspension of not more than about 30 percent by weight based on weight of the system of (b) particles of at least one biologically active macromolecular polypeptide having a molecular weight not less than about 1000 daltons, wherein substantially all of the particles of polypeptide have a diameter of 10μ or less and are uniformly and discreetly dispersed throughout the matrix, and wherein the polypeptide retains at least about 50 percent of the biological activity which it possessed prior to manufacture of the composition.

4,962,092

COMPOSITIONS FOR TREATING DUODENAL ULCERS

Frederick E. Wood, Jr., Maineville, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 47,844, May 6, 1987, abandoned. This application Jun. 6, 1989, Ser. No. 361,890
Int. Cl.[5] A61K 31/70, 9/00
U.S. Cl. 514—23 24 Claims

1. A method for treating duodenal ulcers by treating the patient with pharmaceutically effective amounts of wholly or partially non-digestible low-calorie fat material comprising polyol fatty acid polyesters.

4,962,093

THIABENDAZOLE-CONTAINING ANTIFUNGAL COMPOSITION

Masanori Ohkawa, and Yoshihiro Nishikawa, both of Kanazawa, Japan, assignors to SS Pharmaceutical Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 52,735, Apr. 15, 1987, abandoned. This application Feb. 6, 1990, Ser. No. 474,659
Claims priority, application Japan, Sep. 24, 1985, 60-210806; PCT Int'l Appl., Sep. 8, 1986, PCT/JP86/00455
Int. Cl.[5] A01N 43/78, 43/16, 25/04
U.S. Cl. 514—53 8 Claims

1. An antifungal agent composition, comprising one part by weight of thiabendazole and from greater than 0.1 to 20 part by weight of a sucrose fatty acid ester component, wherein said sucrose fatty acid ester component is one or more sucrose esters of a fatty acid having a C_{8-18} carbon atom-long residue, and wherein said antifungal agent composition as a pH of 3 to 7.5.

4,962,094

GLUCAN DIETARY ADDITIVES

Spiros Jamas, Boston; D. Davidson Easson, Jr., Shrewsbury, and Bruce R. Bistrian, Ipswich, all of Mass., assignors to Alpha Beta Technology, Inc., Worcester, Mass.

Filed Oct. 28, 1988, Ser. No. 264,091
Int. Cl.[5] A61K 31/00
U.S. Cl. 514—54 11 Claims

1. A method of providing a source of fiber in the diet of a mammal comprising administering to the mammal an amount of whole yeast β-glucan sufficient to aid digestion, reduce dehydration or reduce the serum cholesterol level in the mammal.

4,962,095

METHOD OF REDUCING PRE-AND POST-ISCHEMIC MYOCARDIAL ARRHYTHMIAS AND FIBRILLATION

Gary J. Grover, Stockton, N.J., and James L. Bergey, Lansdale, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 311,321, Feb. 15, 1989. This application Dec. 18, 1989, Ser. No. 451,667
Int. Cl.[5] A61K 31/675
U.S. Cl. 514—91 5 Claims

1. A method of reducing pre- and post-ischemic arrhythmias and fibrillation as well as reducing arrhythmias associated with congestive heart failure in a mammalian species which comprises administering to a mammalian species in need of such treatment an effective amount of (S)-1-[6-amino-2-[[hydroxy(4-phenylbutyl)phosphinyl]oxy]-1-oxohexyl]-L-proline or a pharmaceutically acceptable salt thereof alone or in combination with a thrombolytic agent, antiarrhythmic agent, or antifibrillatory agent or with a non-pharmaceutical reperfusion technique.

4,962,096

HETEROCYCLIC GLYCEROL DERIVATIVES AND THEIR USE AS ANTI-HYPERTENSIVE AGENTS

Mitsuo Masaki, Chiba; Hiromitsu Takeda, Washimiya; Toshiro Kamishiro, and Masao Yamamoto, both of Misato, all of Japan, assignors to Nippon Chemiphar Co., Ltd., Tokyo, Japan

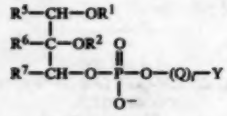
Filed Mar. 24, 1988, Ser. No. 172,581

Claims priority, application Japan, Mar. 24, 1987, 62-69943; Mar. 24, 1987, 62-69944; Mar. 31, 1987, 62-80705; Mar. 31, 1987, 62-80706

Int. Cl.[5] C07F 9/6539, 9/6541; A61K 31/425

U.S. Cl. 514—92 7 Claims

1. A glycerol derivative having the formula:



wherein

R^1 is a straight or branched chain alkyl group having 10–22 carbon atoms;

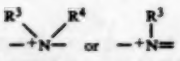
R^2 is a straight or branched chain acyl group having 1–6 carbon atoms or benzoyl;

R^5, R^6 and R^7 are independently hydrogen or a straight or branched chain alkyl group having 1–6 carbon atoms;

Q is a saturated or unsaturated alkylene divalent bridging radical having 1–4 carbon atoms optionally substituted by one or two methyl or phenyl groups,

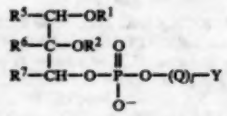
l is 1; and

Y represents a heterocyclic group containing nitrogen and sulfur atoms selected from the group consisting of thiazolidinyl, thiazolyl, and benzothiazolyl, which has a moiety represented by



wherein R^3 and R^4 are independently a straight or branched chain alkyl group having 1–6 atoms, said heterocyclic group optionally having one or two substituents selected from the group consisting of a straight or branched chain alkyl group having 1–6 carbon atoms or phenyl, or a pharmaceutically acceptable salt thereof.

2. An anti-hypertensive composition useful in achieving reduction in blood pressure in the treatment of hypertension consisting of an effective amount of a glycerol compound in admixture with an inert carrier or diluent, wherein said compound has the formula:



wherein

R^1 is a straight or branched chain alkyl group having 10–22 carbon atoms;

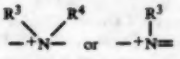
R^2 is a straight or branched chain acyl group having 1–6 carbon atoms or benzoyl;

R^5, R^6 and R^7 are independently hydrogen or a straight or branched chain alkyl group having 1–6 carbon atoms;

Q is a saturated or unsaturated alkylene divalent bridging radical having 1–4 carbon atoms optionally substituted by one or two methyl or phenyl groups,

l is 1; and

Y represents a heterocyclic group containing nitrogen and sulfur atoms selected from the group consisting of thiazolidinyl, thiazolyl, and benzothiazolyl, which has a moiety represented by



wherein R^3 and R^4 are independently a straight or branched chain alkyl group having 1–6 atoms, said heterocyclic group optionally having one or two substituents selected from the group consisting of a straight or branched chain alkyl group having 1–6 carbon atoms or phenyl, or a pharmaceutically acceptable salt thereof.

4,962,097

METHOD OF TREATING BACTERIAL INFECTION WITH PHOSPHORUS CONTAINING DHP ENZYME INHIBITORS

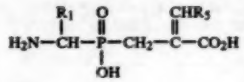
William H. Parsons, Rahway; William R. Schoen, Edison, and ARthur A. Patchett, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 264,228, Oct. 28, 1988, abandoned. This application Aug. 17, 1989, Ser. No. 395,309

Int. Cl.[5] C07F 9/30, 9/32; A01N 31/02, 57/12

U.S. Cl. 514—114 5 Claims

1. A method of treatment for bacterial infections which comprises administering to a host a therapeutically effective amount of a DHP-inhibiting compound of Formula II, in combination with a therapeutically effective amount of a carbapenem or penem antibiotic:



II

wherein:

R_1 is

(a) C_2–C_{12} linear or branched unsubstituted alkyl;

(b) C_1–C_{12} linear or branched substituted alkyl;

(c) C_2–C_{12} linear or branched monoalkenyl;

(d) C_2–C_{12} linear or branched alkynyl;

(e) C_7–C_{20} aralkyl, wherein the alkyl chain is linear or branched C_1–C_8 and the aryl moiety is C_6–C_{12};

(f) C_4–C_{10} cycloalkylalkyl;

(g) C_3–C_7 cycloalkyl;

wherein said above values for R_1, excluding (a), can be substituted by one or more: C_1–C_4 alkoxy, C_3–C_6 cycloalkyloxy, C_3j–C_6 cycloalkylthio, C_6–C_{12} aryloxy, C_1–C_4 alkylthio, C_6–C_{12} arylthio, C_7–C_{10} aralkyloxy, C_7–C_{16} aralkylthio;

R_5 is

(a) H or C_1–C_{12} linear or branched alkyl;

(b) C_2–C_{12} linear or branched monoalkenyl;

(c) C_7–C_{20} aralkyl, wherein the alkyl chain is linear or branched C_1–C_8 and the aryl moiety is C_6–C_{12};

(d) C_4–C_{10} cycloalkylalkyl

(e) C_3–C_7 cycloalkyl

(f) heterocyclic alkyl, wherein the alkyl chain is linear or branched C_1–C_8 and the heterocyclic ring is 5–6 membered, optionally fused benzene ring, fully aromatic, containing 1–2 O, N or S heteroatoms;

wherein said above value for R_5 can be substituted by one or more: halo, hydroxy, carboxy, C_1–C_4 alkoxycarbonyl, C_7–C_{16} arylalkoxycarbonyl, C_3–C_7 cycloalkyl, C_1–C_4 alkoxy, C_6–C_{12} aryloxy, C_3–C_6 cycloalkyloxy, C_3–C_6 cycloalkylthio, amino, mono- or di-C_1–C_8 alkylamino, thio, C_1–C_4 alkylthio, C_6–C_{12} arylthio, C_7–C_{16} aralkylthio, or the radical —S—(CH_2)n—$CH(NH_2)COOH$, where n=1–2; and including DHP-inhibiting stereoisomers and racemates thereof Structure II.

4,962,098

GRADUATED ESTROGEN CONTRACEPTIVE

Roger M. Boissonneault, Long Valley, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 61,646, Jun. 15, 1987, abandoned, which is a continuation-in-part of Ser. No. 659,144, Oct. 9, 1984, abandoned. This application Apr. 20, 1989, Ser. No. 340,974

Int. Cl.[5] A61K *31/56*

U.S. Cl. 514—170 9 Claims

1. A method of contraception comprising the steps of sequentially-administering to a female of child bearing age:

(1) for about 4 to about 7 days, a composition I containing about 0.5–1.5 mg norethindrone acetate and about 10–50 mcg ethinyl estradiol,

(2) for about 5 to about 8 days, a composition II containing about 0.5–1.5 mg norethindrone acetate and about 10–50 mcg ethinyl estradiol, and

(3) for about 7 to about 12 days, a composition III containing 0.5–1.5 mg norethindrone acetate and about 10–50 mcg ethinyl estradiol, wherein the amount of ethinyl estradiol is increased stepwise by the amount of at least 5 mcg in each step.

4,962,099

CHEMICAL SYNTHESIS

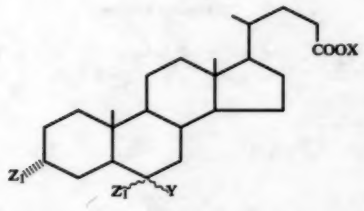
Erwin H. Mosbach; Charles K. McSherry, both of New York, N.Y.; Mizuho Une, Hiroshima, Japan, and Naoyuki Matoba, New York, N.Y., assignors to Beth Israel Medical Center, New York, N.Y.

Continuation-in-part of Ser. No. 141,828, Jan. 11, 1988, abandoned. This application Jan. 5, 1989, Ser. No. 293,327

Int. Cl.[5] A61K *31/56*

U.S. Cl. 514—177 8 Claims

1. The compounds of the formula:



wherein each Z_1 may be OH or acyloxy; Y is alkyl; X may be H, acyl or lower alkyl; and the non-toxic pharmaceutically acceptable salts thereof.

4,962,100

3-CONDENSED IMIDAZOLIUM-CEPHEM COMPOUNDS

Akio Miyake; Masahiro Kondo, both of Osaka, and Masahiko Fujino, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

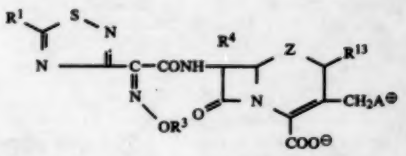
Continuation of Ser. No. 834,969, Feb. 28, 1986, Pat. No. 4,864,022. This application Mar. 28, 1989, Ser. No. 331,192

Claims priority, application Norway, Apr. 17, 1985, 851538; Japan, Sep. 20, 1985, 60-209320

Int. Cl.[5] C07D *501/56;* A61K *31/545*

U.S. Cl. 514—202 29 Claims

1. A compound of the formula:



wherein R^1 is an amino or protected amino group; R^3 is a hydrogen atom or a C_{1-3} alkyl group which is unsubstituted or substituted by halogen atom, hydroxy group, C_{1-6} alkoxy group, carboxyl group, C_{1-6} alkoxycarbonyl group, the number of the substituents being one to three or by a cyano group; Z is S or S→O; R^4 is a hydrogen atom, methoxy group or formamido group; R^{13} is a hydrogen atom and $A^{\oplus}$ is an imidazolium-1-yl group having at the 2,3- or 3,4-position a 5- to 6-membered aromatic heterocyclic ring condensed therewith, the condensed aromatic heterocyclic ring including carbon and at least one heteroatom selected from nitrogen, oxygen and sulfur, which is unsubstituted or substituted by C_{1-6} alkyl, halogen, C_{1-6} alkoxy, di-C_{1-6} alkylamino, C_{1-6} alkylthio, cyano or di-C_{1-6} alkylamino-C_{1-6} alkyl, the number of the substituents being one to two, or a pharmaceutically acceptable salt or ester thereof.

4,962,101

2-(HETEROCYCLYLALKYL)PHENYL CARBAPENEM ANTIBACTERIAL AGENTS

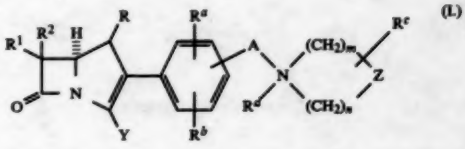
Frank P. DiNinno, Old Bridge, and Thomas N. Salzmann, North Plainfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 21; 1989, Ser. No. 396,163

Int. Cl.[5] C07D *487/04;* A61K *31/40*

U.S. Cl. 514—210 12 Claims

1. A compound of the formula:



wherein:

R is H or CH_3;

R^1 and R^2 are independently H, CH_3—, CH_3CH_2—, $(CH_3)_2CH$—, $HOCH_2$—, $CH_3CH(OH)$—, $(CH_3)_2C(OH)$—, $FCH_2CH(OH)$—, $F_2CHCH(OH)$—, $F_3CCH(OH)$—, $CH_3CH(F)$—, CH_3CF_2—, or $(CH_3)_2C(F)$—;

R^a, R^b, and R^c are independently selected from the group consisting of

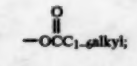
(a) a trifluoromethyl group: —CF_3;

(b) a halogen atom: —Br, —Cl, —F, or —I;

(c) C_1–C_4 alkoxy radical —OC_{1-4} alkyl;

(d) a hydroxy group: —OH;

(e) (C_1–C_6 alkyl) carbonyloxy radical:



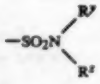
(f) a carbamoyloxy radical which is unsubstituted or substituted on nitrogen with one or two C_1–C_4 alkyl groups:

where R^y and R^z are indeperdently H or C_{1-4} alkyl,

(g) a C_1–C_6 alkylthio radical, C_1–C_6 alkylsulfinyl radical or C_1–C_6 alkylsulfonyl radical:

alkyl where n=0-2, and the alkyl portion is optionally substituted by cyano;

(h) a sulfamoyl group which is unsubstituted or substituted on nitrogen by one or two C_1–C_4 alkyl groups:



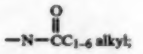
where R^y and R^z are as defined above;

(i) an amino group, or a mono (C_1–C_4 alkyl) amino or di(C_1–C_4 alkyl)amino group:

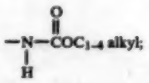
where R^y and R^z are as defined above;

(j) a formylamino group:

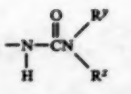
(k) (C_1–C_6 alkyl)carbonylamino radical:



(l) a (C_1–C_4 alkoxy) carbonylamino radical:

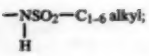


(m) a ureido group in which the terminal nitrogen is unsubstituted or substituted with one or two C_1–C_4 alkyl groups:



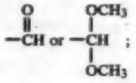
where R^y and R^z are as defined above;

(n) a sulfonamido group:

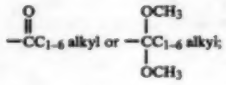


(o) a cyano group; —CN;

(p) a formyl or acetalized formyl radical:

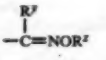


(q) (C_1–C_6 alkyl)carbonyl radical wherein the carbonyl is free or acetalized;



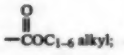
(r) phenylcarbonyl;

(s) a hydroximinomethyl radical in which the oxygen or carbonatom is optionally substituted by a C_1–C_4 alkyl group;



where R^y and R^z are as defined above;

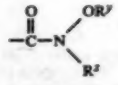
(t) a (C_1–C_6 alkoxy)carbonyl radical;



(u) a carbamoyl radical which is unsubstituted or substituted on nitrogen by one or two C_1–C_4 alkyl groups;

where R^y and R^z are as defined above;

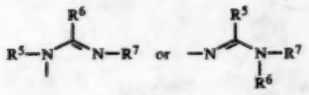
(v) an N-hydroxycarbamoyl or N(C_1–C_4 alkoxy)carbamoyl radical in which the nitrogen atom may be additionally substituted by a C_1–C_4 alkyl group;



where R^y and R^z are as defined above;

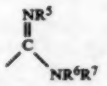
(w) a thiocarbamoyl group:

(x) an amidino group



where R^5, R^6 and R^7 are independently hydrogen, C_1–C_4alkyl or wherein two of the alkyl groups together form a C_2–C_5alkylidene radical optionally interrupted by a heteroatom and joined together to form a ring;

(y) a carboxamidino group



where R^5, R^6 and R^7 are as defined above;

(z) a guanidinyl group where R^6 in (a) above is NR^8R^9 and R^8 and R^9 are as defined for R^5 through R^7 above;

(aa) hydrogen;

(ab) C_2–C_6 alkenyl radical;

(ac) an unsubstituted or substituted C_2–C_6 alkynyl radical;

(ad) C_3–C_7 cycloalkyl radical;

(ae) C_3–C_7 cycloalkyl methyl radical;

(af) C_5–C_7 cycloalkenyl radical;

(ag) phenyl, except that only R^c may be phenyl,

(ah) C_1–C_6 alkyl radical;

(ai) C_1–C_4 alkyl monosubstituted by one of the substituents (a)–(ag) above;

(aj) an anionic function selected from the group consisting of:

phosphono [$P{=}O(OM^c)_2$]; alkylphosphono {$P{=}O(OM^c)[O(C_1$–C_4 alkyl)]}; alkylphosphinyl [$P{=}O(OM^c){-}(C_1$–C_4alkyl)]; phosphoramido [$P{=}O(OM^c)N(R^y)R^z$ and $P{=}O(OM^c)NHR^z$]; sulfino (SO_2M^c); sulfo (SO_3M^c); acylsulfonamides selected from the structures $CONM^cSO_2R^x$, $CONM^cSO_2N(R^y)R^z$, $SO_2NM^cCON(R^y)R^z$; and SO_2NM^cCN, where

R^x and the phenyl is optionally mono substituted by R^q; M^c is hydrogen or an alkali metal; R^y and R^z are as defined above; where

R^q is a member selected from the group consisting of —OH; —OCH_3; —CN; —$C(O)NH_2$; —$OC(O)NH_2$; —$OC(O)N(CH_3)_2$; —SO_2NH_2; —$SO_2N(CH_3)_2$; —$SOCH_3$; —F; —CF_3; tetrazolyl; and —$COOM^a$, where M^a is hydrogen, alkali metal, methyl or phenyl;

R^d is C_1–C_4 alkyl, making the nitrogen atom of the N-heterocyclyl moiety to which it is attached quaternary; or it may be absent;

A is para (p) or meta (m) with respect to the point of attachment of the phenyl ring to the carbapenem nucleus, and is $(CH_2)_m$—Q—$(CH_2)_n$, where m is 0 to 2 and n is 1 or 2; and Q is a covalent bond;

Z is a member selected from the group consisting of CH_2, O, S, SO, SO_2, N(R′) and $^+N(R')(R'')$, where R′ and R″ are independently hydrogen, C_1–C_4 alkyl, or oxo; provided that where R^d is not absent, Z cannot be $^+N(R')(R'')$;

m is 2 or 3;

n is 1 or 2; and

Y is selected from:

(i) COOH or a pharmaceutically acceptable ester thereof;

(ii) COOM wherein M is an alkali metal or other pharmaceutically acceptable salt;

(iii) COOM wherein M is a negative charge in the case where a permanent positive charge exists elsewhere in the molecule.

4,962,102

PESTICIDAL 4-HALOGENO-5-NITROTHIAZOLES

Gunther Beck, Leverkusen; Wilhelm Brandes, Leichlingen; Stefan Dutzmann, Duesseldorf, and Wilfried Paulus, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

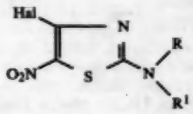
Filed Jul. 12, 1989, Ser. No. 378,894

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1988, 3824520; Dec. 21, 1988, 3842970

Int. Cl.[5] C07D 277/58; A01N 43/78

U.S. Cl. 514—212 5 Claims

1. A 2-amino-4-halogeno-5-nitrothiazole of the formula



in which

Hal represents fluorine, chlorine, bromine or iodine,

R^1 represents hydrogen, allyl having 1 to 4 carbon atoms, alkenyl having 3 to 5 carbon atoms or halogenoalkyl having 1 to 3 carbon atoms and 1 to 5 identical or different halogen atoms, or represents cyanoalkyl having 1 or 2 carbon atoms in the alkyl part, or represents cycloalkyl having to 6 carbon atoms, or represents phenyl or phenylalkyl having 1 to 3 carbon atoms in the alkyl part and in each case optionally substituted by one to three identical or different substitutents from the group consisting of alkyl having to 4 carbon atoms, fluorine, chlorine, bromine and alkoxy having 1 to 4 carbon atoms and

R represents alkyl having 1 to 12 carbon atoms, alkenyl having 3 to 12 carbon atoms, alkinyl having 4 to 12 carbon atoms or halogenoalkyl, halogenoalkenyl or halogenoalkinyl having in each case up to 8 carbon atoms and 1 to 10 identical or different halogen atoms, or represents alkoxyalkyl, alkylmercaptoalkyl or cyanoalkyl having 1 to 4 carbon atoms per alkyl part, or represents phenyloxyalkyl or phenylmercaptoalkyl having 1 to 4 carbon atoms in the alkyl part, it being possible for the phenyl radicals to be optionally substituted by one to three identical or different substituents from the group consisting of fluorine, chlorine, bromine and alkyl having 1 to 4 carbon atoms, or represents cycloalkyl having 3 to 8 carbon atoms and optionally substituted by one to three identical or different alkyl substituents having 1 to 4 carbon atoms, it being possible for the cyclo-alkyl ring additionally to contain a fused-on ring, or represents phenylalkyl having 1 to 4 carbon atoms in the alkyl part and optionally substituted by one to five identical or different substituents from the group consisting of halogen, alkyl having 1 to 4 carbon atoms, halogenoalkyl having 1 to 4 carbon atoms and 1 to 8 identical or different halogen atoms, nitro, cyano, alkoxy having 1 to 4 carbon atoms and alkylmercapto having 1 to 4 carbon atoms, the alkyl part of the phenylalkyl optionally containing, as a substitutent, a further phenyl radical which can optionally be substituted as described above, or represents phenyl which is optionally substituted by one to five identical or different substituents from the group consisting of halogen, nitro, alkyl having 1 to 12 carbon atoms, alkoxy, alkylmercapto, carbalkoxy, alkylsulphonylamino, alkylsulphonyl, sulphamoyl, N-alkylsulphamoyl, N,N-dialkylsulphamoyl, dialkylamino, carbamoyl, N-alkylcarbamoyl or N,N-dialkylcarbamoyl having in each case 1 to 4 carbon atoms per alkyl radical, alkenyl or alkinyl having up to 6 carbon atoms, halogenoalkyl, halogenoalkoxy or halogenoalkylmercapto having in each case 1 to 4 carbon atoms and 1 to 8 identical or different halogen atoms per radical listed, phenyl, phenoxy, phenylmercapto, acyloxy having 1 to 3 carbon atoms, acyl having 1 to 3 carbon atoms, phenylalkyloxy having 1 to 3 carbon atoms in the alkyl part, phenylalkylmercapto hav-

ing 1 to 3 carbon atoms, acylamino having 1 to 3 carbon atoms, acylalkylamino having 1 to 3 carbon atoms per acyl and alkyl radical, cycloalkyl having 4 to 6 carbon atoms and cyano, or represents naphthyl, or

R and R^1, together with the nitrogen atom on which they stand, form a ring having 5 to 7 ring members, which can optionally contain one or two further nitrogen and/or oxygen atoms and can optionally be substituted by one to three alkyl radicals having 1 to 4 carbon atoms.

4,962,103

CARBAPENEM COMPOUNDS AND PRODUCTION THEREOF

Makoto Sunagawa, Osaka; Haruki Matsumura, Nara; Takaaki Inoue; Masamoto Fukasawa, both of Hyogo, and Masuhiro Kato, Osaka, all of Japan, assignors to Sumitomo Pharmaceuticals Company, Limited, Osaka, Japan

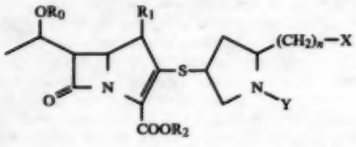
Continuation of Ser. No. 796,329, Nov. 8, 1985, abandoned. This application Mar. 17, 1989, Ser. No. 325,025

Claims priority, application Japan, Nov. 8, 1984, 59-234064; Jan. 7, 1985, 60-577; Jan. 9, 1985, 60-1925

Int. Cl.[5] C07D *487/04*; A61K *31/40*

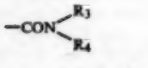
U.S. Cl. 514—210 **29 Claims**

1. A compound of the formula:



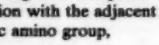
(I)

wherein R_1 is a hydrogen atom or a lower alkyl group, R_2 is a hydrogen atom or a conventional protecting group for a carboxyl group, R_0 is a hydrogen atom or a conventional protecting group for a hydroxyl group, X is a protected or unprotected amino group, a carboxyl group, a lower alkoxycarbonyl group, an ar(lower)alkyloxycarbonyl group, a cyano group, a hydroxyl group, a lower alkyloxy group, a lower alkylthio group, a lower alkylsulfonyl group or a group of either one of the following formulas:



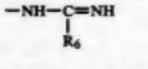
(1)

wherein R_3 and R_4, which may be the same or different, each represent a hydrogen atom or a lower alkyl group, or they are taken together to represent an alkylene chain to form, in combination with the adjacent nitrogen atom, a 3- to 7-membered cyclic amino group,



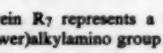
(2)

wherein Z represents —NH— or —O— and R_5 represents an amino group, a mono(lower)alkylamino group, a di(lower)alkylamino group, a lower alkyloxy group or a lower alkyl group,



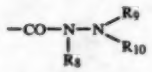
(3)

wherein R_6 represents a hydrogen atom or a lower alkyl group,



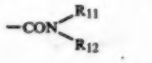
(4)

wherein R_7 represents a mono(lower)alkylamino group, a di(lower)alkylamino group or a lower alkyloxy group, or



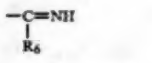
(5)

wherein R_8, R_9 and R_{10}, which may be the same or different, each represent a hydrogen atom or a lower alkyl group, Y represents a hydrogen atom, a conventional protecting group for an amino group or a group of either one of the following formulas:



(6)

wherein R_{11} and R_{12}, which may be the same or different, each represents a hydrogen atom or a lower alkyl group or



(7)

wherein R_6 is as defined above and n is an integer of 1 to 6, and a pharmacologically acceptable salt thereof.

4,962,104

FUNGICIDAL SUBSTITUTED 2-PHENYL-2,2-DIFLUOROETHYLTHIOLCARBONATES, COMPOSITIONS AND USE

Werner Daum, Krefeld; Dietmar Bielefeldt, Ratingen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

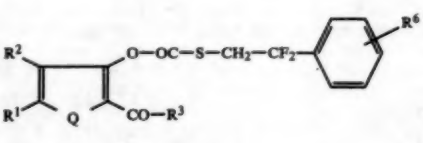
Filed Dec. 6, 1989, Ser. No. 446,955

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1988, 3842626

Int. Cl.[5] A01N *43/10, 43/84*; C07D *413/06, 333/38*

U.S. Cl. 514—212 **13 Claims**

1. A substituted 2-phenyl-2,2-difluoroethylthiolcarbonate of the formula



(I)

in which

R^1 represents hydrogen, alkoxycarbonyl, alkoxyalkoxycarbonyl, alkylthioalkoxycarbonyl, halogenoalkoxycarbonyl, cyanoalkoxycarbonyl, alkenoxycarbonyl, alkynoxycarbonyl and cycloalkyloxycarbonyl, or represents cycloalkylalkoxycarbonyl,

R^2 represents hydrogen or alkyl, or represents phenyl, or

R^1 and R^2 together represent the butadiene-1,4-diyl radical,

R^3 represents alkoxy, alkoxyalkoxy, alkylthioalkoxy, fluoroalkoxy, cyanoalkoxy, alkenoxy, alkynoxy, cycloalkyloxy and cycloalkylalkoxy, or represents the group

in which

R^4 represents alkyl, alkoxyalkyl, alkylthioalkyl, cyanoalkyl, fluoroalkyl, alkenyl, alkinyl or cycloalkyl,

R^5 represents hydrogen, alkyl, alkoxyalkyl, alkylthioalkyl, fluoroalkyl, cyanoalkyl, alkenyl, alkinyl or cycloalkyl, or R^4 and R^5 together with the nitrogen atom at which they are located represent an unsubstituted or substituted heterocyclic ring which can be substituted in the alkylene chain by further hetero atoms,

R^6 represents hydrogen, methyl or chlorine, and

Q represents sulphur.

12. A method of combating fungi which comprises applying to such fungi or to a fungus habitat a fungicidally effective amount of a compound according to claim 1.

4,962,105

POTENTIATION OF ANTIHYPERTENSIVE EFFECT OF ACE INHIBITORS

Gary M. Ksander, Milford, and Mark B. Zimmerman, Springfield, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 19, 1987, Ser. No. 109,965

Int. Cl.[5] A61K *31/55*; C07D *223/6*

U.S. Cl. 514—212 **16 Claims**

1. A method of potentiating the antihypertensive effect of an angiotensin converting enzyme inhibitor in a mammal receiving an angiotensin converting enzyme inhibitor selected from the group consisting of benzepril, benazeprilat, libenzapril, and a pharmaceutically acceptable salt thereof, which comprises the administration to said mammal in combination with said enzyme inhibitor of an effective potentiating amount of 1-(7-carboxyheptyl)-3methyl-2-(3-pyridyl)-indole, 1-methyl-2-(3-pyridyl)-3-(5carboxypentyl)-5-chloroindole, or a pharmaceutically acceptable salt thereof, said effective antihypertensive potentiating amount being essentially devoid of antihypertensive activity.

8. A method of treating hypertension in a mammal which comprises administering to a mammal in need thereof a combination of

(a) an effective antihypertensive amount of an angictensin converting enzyme inhibitor selected from the group consisting of benazepril, benazeprilat and libenzapril, and a pharmaceutically acceptable salt thereof, and

(b) 1-(7-carboxyheptyl)-3-methyl-2-(3-pyridyl)-indole or 1-methyl-2-(3-pyridyl)-3-(5-carboxypentyl)-5-chloroindole, or a pharmaceutically acceptable salt thereof, in an amount essentially devoid of antihypertensive activity and effective in enhancing the antihypertensive effect of said angiotensin converting enzyme inhibitor.

4,962,106

IMIDAZOPYRIDINE DERIVATIVES

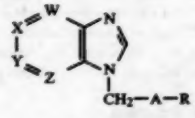
Paul W. Manley, Monks Risborough, and Roderick A. Porter, High Wycombe, both of United Kingdom, assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 908,126, Sep. 15, 1986, Pat. No. 4,804,658. This application Feb. 9, 1989, Ser. No. 308,349

Int. Cl.[5] A61K *31/55, 31/435, 31/54, 31/535*

U.S. Cl. 514—234.2 **2 Claims**

1. A method for treating diseases or disorders mediated by platelet-activating factor comprising administering to a mammal in need of such treatment a therapeutically effective dose of at least one compound of the formula

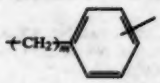


or a pharmaceutically acceptable acid addition salt thereof; wherein

one of W, X, Y, and Z is —N— and the others of W, X, Y, and Z are each —CH—;

A is

(a) a



group wherein m is 0 or 1, or

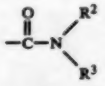
(b) a $-(CH_2)_n-(CR^5R^6)_p-$ group wherein n is an integer from 0 to 8, p is an integer from 0 to 2, and R^5 and R^6 are independently hydrogen or C_1–C_4 alkyl; and

R is

(a) a

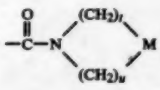
group wherein R^1 is C_1–C_8 alkyl;

(b) a



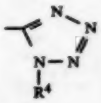
group wherein R^2 and R^3 are independently hydrogen, C_1–C_8 alkyl, or C_3–C_8 cycloalkyl;

(c) a



group wherein t and u are independently integers from 1 to 3 and M is —O—, —S—, or —CH_2—; or

(d) a



group wherein R^4 is hydrogen, C_1–C_8 alkyl, or C_3–C_8 cycloalkyl.

4,962,107

AGENT FOR CEREBRAL PROTECTION

Joji Nakamura; Kazuhiro Kubo; Shunji Ichikawa; Hajime Takahashi; Keisuke Isozumi, and Toyofumi Yamada, all of Shizuoka, Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha and Ihara Chemical Kogyo Kabushiki Kaisha, both of, Japan

Division of Ser. No. 829,382, Feb. 13, 1986, Pat. No. 4,824,842. This application Mar. 10, 1989, Ser. No. 321,692

Claims priority, application Japan, Feb. 14, 1985, 60-27450

Int. Cl.[5] A61K *31/535*; C07D *265/30*

U.S. Cl. 514—237.5 **2 Claims**

1. The compound 3-methyl-4-(4-trifluoromethyl-cinnamoyl) morpholine.

2. A cerebral protection pharmaceutical composition comprising a pharmacologically effective amount of a compound according to claim 1 in a pharmaceutically acceptable carrier.

4,962,108

ANTIBACTERIAL QUINOLINE COMPOUNDS

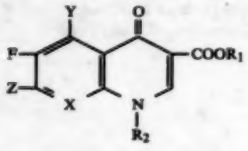
Marland P. Hutt, Jr., Saline, and John S. Kiely, Ann Arbor, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 80,113, Jul. 31, 1987, Pat. No. 4,923,879. This application Dec. 9, 1988, Ser. No. 282,169

Int. Cl.[5] A61K *31/47*; C07D *471/04*

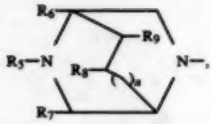
U.S. Cl. 514—249 12 Claims

1. A compound of the formula

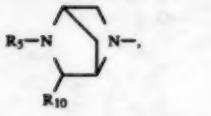


I

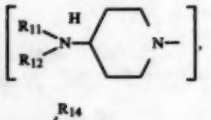
wherein Z is selected from the group consisting of (a) to (e):



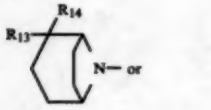
(a)



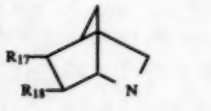
(b)



(c)



(d)



(e)

wherein

n is 0 is 1;

R_5 and R_6 are each independently hydrogen, methyl, ethyl, or benzyl with the proviso that if R_6 is hydrogen, n is 1;

R_7, R_8, and R_9 are each independently hydrogen or methyl, with the proviso that if R_6 is hydrogen, at least one of R_8 and R_9 is methyl;

R_{10} is methyl, ethyl or isopropyl;

the dotted line shows a double or single bond, R_{13} is CH_2OR_{15}, $CH_2NR_{15}R_{16}$, or $NR_{15}R_{16}$ wherein R_{15} and R_{16} are hydrogen, alkyl of from 1–3 carbon atoms, alkanoyl of from 1–3 carbon atoms; R_{14} is hydrogen or alkyl of one to three carbons, or

R_{17} and R_{18} are each independently hydrogen, $NR_{19}R_{20}$, OR_{19}, SR_{19}, alkyl of from one to three carbon atoms, or halogen, wherein R_{19} and R_{20} are each independently hydrogen, alkyl of from one to three carbon atoms, or alkanoyl of from one to three carbon atoms;

X is CH, CF, CCl, or C—CF_3;

Y is hydrogen, fluoro, or amino;

R_1 is hydrogen, alkyl having from one to six carbon atoms or a cation;

R_2 is an alkyl of from one to four carbon atoms, vinyl, haloalkyl, hydroxyalkyl of from two to four carbon atoms, or a cycloalkyl of from three to six carbon atoms, phenyl, or substituted phenyl wherein the substituents on the phenyl are halogen, amino, hydroxy, or alkyl;

or a pharmaceutically acceptable acid addition or base salt thereof;

4,962,109

INSECTICIDALLY AND ACARICIDALLY ACTIVE PYRIMIDINE ESTERS AND INTERMEDIATES THEREFOR

Edward McDonald, Marlow; Roger Salmon, Bracknell, and Alan J. Whittle, Twyford, all of Great Britain, assignors to Imperial Chemical Industries PLC, London, England

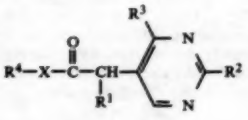
Continuation-in-part of Ser. No. 942,436, Dec. 16, 1986, Pat. No. 4,762,835. This application Jun. 13, 1988, Ser. No. 206,097

Claims priority, application United Kingdom, Dec. 23, 1985, 8531637; Jun. 17, 1987, 8714233

Int. Cl.[5] A61K *31/505, 31/535*; C07D *239/26, 239/34, 239/42, 401/10, 403/10, 413/10*

U.S. Cl. 514—256 15 Claims

1. A compound of formula (I):



(I)

and stereoisomers thereof, wherein:

R^1 is selected from alkyl having 1 to 6 carbon atoms; alkenyl having 2 to 8 carbon atoms; alkynyl having 2 to 6 carbon atoms; haloalkyl having 1 to 4 carbon atoms; haloalkenyl having 2 to 8 carbon atoms; and cycloalkyl having 3 to 6 carbon atoms optionally substituted by one or more substituents selected from alkyl having 1 to 4 carbon atoms and halogen;

R^2 is selected from alkyl having 1 to 8 carbon atoms; haloalkyl having 1 to 4 carbon atoms; alkoxy having 1 to 6 carbon atoms; alkylamino having 1 to 4 carbon atoms; dialkylamino having a total of 2 to 8 carbon atoms; halogen; cycloalkyl having 3 to 6 carbon atoms optionally substituted by one or more substituents selected from halogen and alkyl having 1 to 4 carbon atoms; and phenyl optionally substituted with one or more substituents selected from alkyl having 1 to 4 carbon atoms, haloalkyl having 1 to 4 carbon atoms, halogen and alkoxy having 1 to 4 carbon

R^3 is selected from hydrogen and halogen;

R^4 is the residue of an alcohol of formula R^4-OH which forms an insecticidal ester when reacted with chrysanthemic acid, permethrin acid or cyhalothrin acid; and

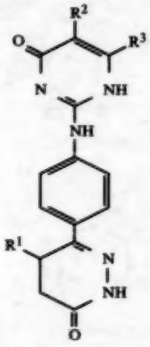
X is selected from oxygen and sulphur.

4,962,110
PYRIDAZINONE DERIVATIVES

John C. Emmett, Welwyn, and William J. Coates, Welwyn Garden City, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Continuation of Ser. No. 837,975, Mar. 10, 1986, abandoned.
This application Aug. 10, 1989, Ser. No. 392,687
Int. Cl.[5] C07D *401/10*; A61K *31/50*
U.S. Cl. 514—252 21 Claims

1. A compound of the formula (I):



(I)

or a pharmaceutically acceptable salt thereof, wherein

R^1 is hydrogen or methyl; and

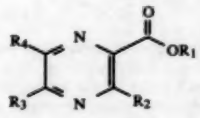
R^2 and R^3 are independently hydrogen, C_{1-4}alkyl, phenyl(C_{1-4})alkyl or pyridyl(C_{1-4})alkyl, any of such groups being optionally substituted by one or two hydroxy, C_{1-4}alkoxy or C_{1-4}alkyl groups; or R^2 and R^3 together with the carbon atoms to which they are joined form a benzene ring which is optionally substituted by C_{1-4}alkyl.

4,962,111
PYRAZINOIC ACID ESTERS AS ANTITUBERCULOSIS AGENTS

John T. Welch, Albany, and Michael H. Cynamon, Syracuse, both of N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Filed Jun. 8, 1989, Ser. No. 364,067
Int. Cl.[5] A61K *31/495*; C07D *241/14*, *241/16*, *241/18*
U.S. Cl. 514—255 24 Claims

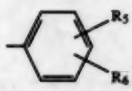
1. A composition comprising a compound of formula I or a pharmaceutically acceptable salt thereof having anti-myco bacterium bovis, anti-mycobacterium tuberculosis or anti-mycobacterium kansasii activity and a pharmaceutically acceptable carrier:



I

wherein: R_1 is

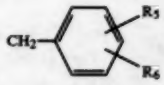
(a) a lower alkyl:
(b) a lower haloalkyl;
(c) a lower cycloalkyl;
(d) a lower alkenyl;
(e) a lower alkynyl;
(f) a phenyl, biphenyl or substituted phenyl of the formula II:



II

wherein R_5 and R_6 independently are

(1) Q, where Q is H, lower alkyl, or lower haloalkyl;
(2) halo;
(3) nitro;
(4) OQ; or
(5) SQ; or
(g) a benzyl or substituted benzyl of formula:



Wherein R_5 and R_6 independently are

(1) Q, where Q is H, lower alkyl, or lower haloalkyl;
(2) halo;
(3) nitro;
(4) OQ; or
(5) SQ;

R_2 is

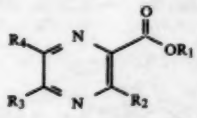
(a) H; or (b) halo; and

R_3 and R_4 independently are

(a) H;
(b) halo;
(c) lower haloalkyl;
(d) OQ; or
(e) SQ.

20. A composition comprising a compound having anti-mycobacterium tuberculosis, anti-mycobacterium bovis or anti-mycobacterium kansasii activity selected from the group consisting of β, β, β-trifluoromethyl pyrazinoate, 4-t-butylphenyl pyrazinoate, p-biphenyl pyrazinoate, n-propyl pyrazinoate, β-chloroethyl pyrazinoate and allyl pyrazinoate, or a pharmaceutically acceptable salt thereof; and a pharmaceutically acceptable carrier.

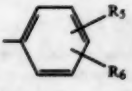
23. A method of treating a mammal infected with *Mycobacterium bovis, Mycobacterium tuberculosis* or *Mycobacterium kansasii* comprising administering to the mammal a non-toxic effective amount of the compound of formula I or a pharmaceutically acceptable salt thereof having anti-mycobacterium bovis, anti-mycobacterium tuberculosis or anti-mycobacterium kansasii activity and a pharmaceutically acceptable carrier:



I

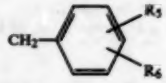
wherein R_1 is

(a) a lower alkyl;
(b) a lower haloalkyl;
(c) a lower cycloalkyl;
(d) a lower alkenyl;
(e) a lower alkynyl;
(f) a phenyl, biphenyl or substituted phenyl of the formula II;



II

wherein R_5 and R_6 independently are
(1) Q, where Q is H, lower alkyl, or lower haloalkyl;
(2) halo;
(3) nitro;
(4) OQ; or
(5) SQ; or
(g) a benzyl or substituted benzyl or formula:



wherein R_5 and R_6 independently are
(1) Q, where Q is H, lower alkyl, or lower haloalkyl;
(2) halo;
(3) nitro;
(4) OQ; or
(5) SQ;
R_2 is
(a) H; or
(b) halo; and
R_3 and R_4 independently are
(a) H;
(b) halo;
(c) lower haloalkyl;
(d) OQ; or
(e) SQ.

24. A method of treating a mammal infected with *Mycobacterium bovis, mycobacterium tuberculosis* or *Mycobacterium kansasii* comprising administering to the mammal a non-toxic effective amount of a compound having anti-mycobacterium tuberculosis, anti-mycobacterium bovis or anti-mycobacterium kansasii activity selected from the group consisting of β, β, β-trifluoroethyl pyrazinoate, 4-t-butylphenyl pyrazinoate, p-biphenyl pyrazinoate, n-propyl pyrazinoate, β-chloroethyl pyrazinoate and allyl pyrazinoate, or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier.

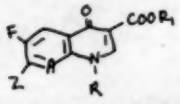
4,962,112

7-(2-METHYL-4-AMINOPYRROLIDINYL)NAPHTHRYIDINE AND QUINOLINE COMPOUNDS

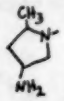
Terry J. Rosen, Deerfield, and Daniel T. Chu, Vernon Hills, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 81,416, Aug. 4, 1987, abandoned, which is a continuation-in-part of Ser. No. 784,421, Oct. 4, 1985, Pat. No. 4,730,000, which is a continuation of Ser. No. 597,854, Apr. 9, 1984, abandoned, which is a continuation-in-part of Ser. No. 574,227, Jan. 26, 1984, abandoned, which is a continuation-in-part of Ser. No. 514,716, Jul. 18, 1983, abandoned. This application Feb. 26, 1988, Ser. No. 160,950
Int. Cl.[5] A61K *31/40, 31/495;* **C07D** *401/14*
U.S. Cl. 514—300 **13 Claims**

1. A compound having the formula:



wherein A is CH or N; R_1 is hydrogen or a carboxy protecting group; R is selected from o,p-difluorophenyl or p-fluorophenyl; and z is [an amino group of the formula:



13. A method of treating a bacterial infection in a patient comprising administering to a patient in need a therapeutically effective amount of a compound as defined in claim **1**.

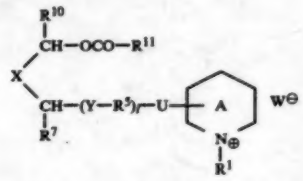
4,962,113

PYRIDINIUM DERIVATIVES, THEIR PRODUCTION AND USE

Susumu Tsushima, Osaka; Muneo Takatani, and Kohei Nishikawa, both of Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd, Osaka, Japan

Filed Jul. 26, 1988, Ser. No. 224,352
Claims priority, application Japan, Jul. 31, 1987, 62-193479; Jun. 6, 1988, 63-138908
Int. Cl.[5] A61K *31/47;* **C07D** *401/12*
U.S. Cl. 514—307 **24 Claims**

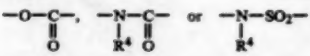
1. A compound of the formula (I):



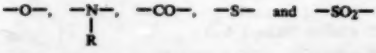
wherein

is a pyridinium ring unsubstituted or substituted by one to four members selected from the class consisting of a halogeno group, a lower alkyl group, a lower alkoxy group, a nitro group, a cyano group, a lower alkoxycarbonyl group, a carbamoyl group and lower alkyl carbamoyl group;
R^1 is a lower alkyl group, a phenyl-lower alkyl group or a naphthyl-lower alkyl group;
R^7 and R^{10} are independently hydrogen, a lower alkyl group, a phenyl-lower alkyl group, a naphthyl-lower alkyl group or aromatic hydrocarbon group selected from the class consisting of phenyl, naphthyl, phenanthryl and anthryl;
ρis 0 or 1;
R^5 is a phenylene group or an alkylene group unsubstituted or substituted by a lower alkyl group;
R^{11} is a 1,2,3,4-tetrahydro-2-isoquinolyl, 1,2,3,4-tetrahydro-1-quinoyl or 1,2,3,4-tetrahydro-2-quinolyl group;
X is a group of the formula: $—CH_2OCH_2—$ or a group of the formula:

wherein R^6 is hydrogen, a lower alkyl or a lower alkoxy group, and m is an integer of 0 to 3;
U is a group of the formula:



wherein R^4 is hydrogen, a lower alkyl group, a phenyl-lower alkyl group, a naphthyl-lower alkyl group or aromatic hydrocarbon group selected from the class consisting of phenyl, naphthyl, phenanthryl and anthryl;
Y is a divalent chain group consisting of one to six members selected from the class consisting of groups of the formulae:



wherein R is hydrogen, a lower alkyl group, acyl group or aromatic hydrocarbon group selected from the class con-

sisting of phenyl, naphthyl, phenanthryl and anthryl, and at least one of which is a group of the formula:

$$-O- \quad \text{or} \quad -\underset{\displaystyle R}{\overset{|}{N}}-,$$

with the proviso that the R groups may be the same or different from each other and

$W^{\ominus}$ is a pharmacologically acceptable anion selected from the class consisting of chloride ion, bromide ion, iodide ion, sulfate ion, nitrate ion, phosphate ion, acetate ion, tosylate ion and mesylate ion.

24. A method for inhibiting activities of platelet activating factor in a mammal, which comprises administering to said mammal an amount effective to inhibit activities of platelet activating factor of a compound as claimed in claim 1.

4,962,114

1-ALKYL-1-SULFONYL-2-ALKOXYCARBONYLSULFENYLHYDRAZINES HAVING ANTINEOPLASTIC ACTIVITY

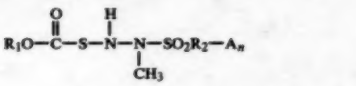
Alan C. Sartorelli, Woodbridge; Krishnamurthy Shyam, Hamden, both of Conn., and Robert T. Hrubiec, Neshanic, N.J., assignors to Yale University, New Haven, Conn.

Continuation-in-part of Ser. No. 820,114, Jan. 21, 1986, abandoned. This application Jun. 4, 1987, Ser. No. 58,161

Int. Cl.[5] **A61K** *31/77, 31/38;* **C07D** *263/46, 215/36*

U.S. Cl. 514—311 **17 Claims**

1. A compound of the formula:



wherein

R_1 is methyl;

R_2 is heteroaryl selected from the group consisting of thienyl, isoxazolyl, prazolyl and quinolinyl;

each A is independently selected from the group consisting of hydrogen, alkyl or alkoxy of 1-4 carbon atoms and halogen; and n is 1 or 2.

17. A method of inhibiting the growth of B16 melanoma tumors in a host organism which comprises administering to said host organism a B16 melanoma tumor inhibiting amount of the compound of claim 1.

4,962,115

NOVEL N-(3-HYDROXY-4-PIPERIDINYL)BENZAMIDE DERIVATIVES

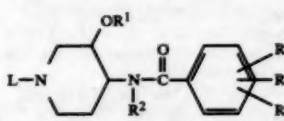
Georges Van Daele, Turnhout, Belgium, assignor to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation of Ser. No. 258,310, Oct. 17, 1988, abandoned, which is a continuation of Ser. No. 631,526, Jul. 18, 1984, abandoned, which is a continuation of Ser. No. 403,603, Jul. 30, 1982, abandoned, which is a continuation-in-part of Ser. No. 307,409, Oct. 1, 1981, abandoned. This application Nov. 28, 1989, Ser. No. 443,060

Int. Cl.[5] **A61K** *31/395;* **C07D** *409/06*

U.S. Cl. 514—326 **39 Claims**

1. A compound of the formula:



(I)

the pharmaceutically acceptable acid addition salts thereof, the stereochemically isomeric forms, and the pharmaceutically acceptable quaternary ammonium salts thereof, wherein:

the substituents in the 3 and 4 positions in the piperidine ring have the cis configuration;

R^1 is a member selected from the group consisting of hydrogen, lower alkyl, (Ar^1) lower alkyl, lower alkylcarbonyl, aminolower alkyl, and mono- and di(lower alkyl)aminolower alkyl;

R^2 is hydrogen or lower alkyl;

R^3, R^4, and R^5 each independently are hydrogen, lower alkyl, lower alkyloxy, halo, hydroxy, cyano, nitro, amino, mono- or di(lower alkyl)amino, aminocarbonyl, (Ar^1)carbonylamino, lower alkylcarbonylamino, lower alkylcarbonyl, lower alkylcarbonyloxy, aminosulfonyl, lower alkylsulfinyl, lower alkylsulfonyl, lower alkylthio or mercapto; and

L is a group of the formula:

$$Q-Y-C_nH_{2n}- \qquad (b)$$

wherein:

n is an integer having a value of from 1 to 4 inclusive;

Y is a direct bond or a bivalent radical selected from the group consisting of —CO—, —NHCO—, —CONH—, —CH=CH—, $CR^8(Q)$—, $-C(OR^6)(R^7)$—, —O—, —S—, $-SO^2$—, and $-NR^9$—, wherein:

R^6 is hydrogen or lower alkyl;

R^7 is hydrogen, cycloalkyl, lower alkyloxy, or lower alkyl;

R^8 is lower alkyloxycarbonyl, cyano, aminocarbonyl, or mono- or di(lower alkyl) aminocarbonyl; and

R^9 is hydrogen, lower alkyl, Ar^1, (Ar^1) lower alkyl, (Ar^1-)carbonyl, or (Arl)sulfonyl; and

Q is hydrogen, cycloalkyl, Ar^1, di(Ar^1)methyl, tri(Ar^1-)methyl, and when Y is other than a direct bond Q may also be lower alkyl or (Ar^1)lower alkyl; and

wherein Ar^1 is a member selected from the group consisting of phenyl being optionally substituted with up to 3 substituents each independently selected from the group consisting of halo, hydroxy, lower alkyl, lower alkyloxy, aminosulfonyl, lower alkylcarbonyl, nitro, trifluoromethyl, amino, aminocarbonyl, phenylcarbonyl wherein said phenyl may be optionally substituted with up to 3 halo atoms, and thienyl substituted with halo or lower alkyl,

provided that L is other than benzyl or substituted benzyl.

5. A pharmaceutical composition in unit dosage form comprising per dosage unit an effective gastro-intestinal motility stimulating amount of a compound as described in claim 1, the pharmaceutically acceptable acid addition salts thereof, the stereochemically isomeric forms, and the pharmaceutically acceptable quaternary ammonium salts thereof.

9. A method of stimulating the motility of the gastro-intestinal system which comprises the systemic administration to vertebrates of an effective gastro-intestinal motility stimulating amount of the compound as described in claim 1, the pharmaceutically acceptable acid addition salts thereof, the stereochemically isomeric forms, and the pharmaceutically acceptable quaternary ammonium salts thereof.

4,962,116

N-(2,6-DISUBSTITUTED AROMATIC)-N'-PYRIDINYL UREAS

Sandra J. Lobbestael, Dexter; Ivan C. Nordin, Holland, both of Mich., and Robert Fleming, Milford, Ohio, assignors to Warner-Lambert Company, Morris Plains, N.J.

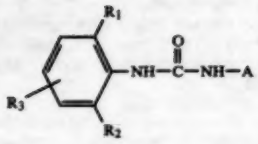
Division of Ser. No. 728,155, Apr. 30, 1985, Pat. No. 4,629,731, which is a continuation of Ser. No. 525,512, Aug. 22, 1983, abandoned. This application Mar. 19, 1986, Ser. No. 841,503

The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.

Int. Cl.[5] **A61K** *31/44*

U.S. Cl. 514—353 **1 Claim**

1. A method of treating epilepsy in mammals suffering therefrom which comprises administering to such mammal an anticonvulsant effective amount of a compound of the formula



wherein A is 3-pyridinyl; R_1 and R_2 are independently halogen, lower alkyl, lower alkoxy, lower alkanoyl, lower alkoxycarbonyl or nitro, and R_3 is hydrogen, halogen, lower alkyl, lower alkoxy, lower alkanoyl, lower alkoxycarbonyl or nitro, or a pharmaceutically acceptable acid addition salt thereof.

4,962,117

HETERAZOLE DIALKANOIC ACIDS

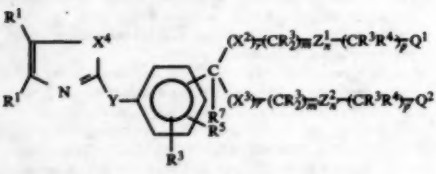
Robert N. Young, Senneville, and Joseph G. Atkinson, Montreal, both of Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Canada

Continuation-in-part of Ser. No. 125,622, Nov. 25, 1987, abandoned. This application Nov. 2, 1988, Ser. No. 265,972

Int. Cl.[5] C07D *277/30, 263/32, 233/26;* **A61K** *31/425*

U.S. Cl. 514—365 **12 Claims**

1. A compound of the formula:



I

wherein:

R^1 is H, halogen, C_1—C_8 alkyl, C_2—C_8 alkenyl, C_2—C_8 alkynyl, —CF_3, —SR^2, —$S(O)R^2$, —$S(O)_2R^2$, —NR^3R^3, —OR^3, —$COOR^3$, —(C=O)R^3, —C(OH)R^3R^3, —CN, —NO_2, —N_3, substituted or unsubstituted phenyl, substituted or unsubstituted benzyl, substituted or unsubstituted 2-phenethyl, or substituted or unsubstituted pyridyl, (wherein substituted means 1 or 2 substituents on the aromatic ring selected from C_1—C_6 alkyl, R^{10}, NO_2, SCF_3, —COR^7, —COR^{10}, CN, halogen, and CF_3)

R^2 is C_1—C_8 alkyl, C_2—C_8 alkenyl, C_2—C_8 alkynyl, —CF_3, substituted or unsubstituted phenyl, substituted or unsubstituted benzyl, or substituted or unsubstituted 2-phenethyl;

R_3 is H or R^2;

R^4 is H, halogen, —NO_2, —CN, —OR^3, —SR^3, NR^3R^3, or C_1—C_8 alkyl; R^5 is H, halogen, —NO_2, —N_3, —CN, —SR^3, —NR^3R^3, —OR^3, C_1—C_6 alkyl, or —(C=O)R^3;

R^6 is —$(CH_2)_r$—$C(R^7R^7)$-$(CH_2)_r$—R^8 or —$CH_2CONR^{12}R^{12}$;

R^7 is H or C_1—C_4 alkyl;

R^8 is (A) a monocyclic or bicyclic heterocyclic radical containing from 3 to 12 nuclear carbon atoms and 1 or 2 nuclear heteroatoms selected from N, S or O and with each ring in the heterocyclic radical being formed of 5 or 6 atoms, or (B) the radical W-R^9;

R^9 contains up to 21 carbon atoms and is (1) a hydrocarbon radical or (2) an acyl radical of an organic acyclic or monocyclic carboxylic acid containing not more than 1 heteroatom in the ring;

R^{10} is —SR^{11}, —OR^{12}, or —$NR^{12}R^{12}$;

R^{11} is C_1—C_6 alkyl, —(C=O)R^{14}, unsubstituted phenyl, or unsubstituted benzyl;

R^{12} is H, R^{11}, or two R^{12} groups joined to the same N may form a ring of 5 or 6 members containing up to two heteroatoms chosen from O, S or N;

R^{13} is C_1—C_8 alkyl, C_2—C_8 alkenyl, C_2—C_8 alkynyl, —CF_3, or unsubstituted phenyl, benzyl, or 2-phenethyl;

R^{14} is H or R^{13};

R^{15} is R^3 or halogen;

R^{16} is H, C_1—C_4 alkyl, or OH;

m and m′ are independently 0–8;

n and n′ are independently 0 or 1;

p and p′ are independently 0–8;

m+n+p is 1–10 when X^2 is O, S, S(O), or $S(O)_2$;

m+n+p is 0–10 when X^2 is CR^3R^{16};

m′+n′+p′ is 1–10 when $X^3$is O, S, S(O), or $S(O)_2$;

m′+n′+p′ is 0–10 when X^3 is CR^3R^{16};

r is O or 1 when Z^1 is HET (—R^3, —R^5);

r is 1 when Z^1 is —$CONR^3$;

r′ is O or 1 when Z^2 is HET(—R^3, —R^5);

r′ is 1 when Z^2 is $CONR^3$;

s is 0–3;

Q^1 and Q^2 are independently —$COOR^3$, tetrazole, —$COOR^6$, —$CONHS(O)_2R^{13}$, —CN, —$CONR^{12}R^{12}$, —CHO, —CH_2OH, —$COCH_2OH$, —$NHS(O)_2R^{13}$; or if Q^1 or Q^2 is COOH and R^4 is —OH, —SH, or —NHR^3 then Q^1 or Q^2 and R^4 and the carbons through which they are attached may form a heterocyclic ring by loss of water;

W is O, S, or NR^3;

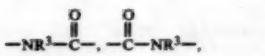
X^1 is O, S, —S(O)—, —$S(O)_2$—, —NR^3, or —CR^3R^3;

X^2 and X^3 are independently O, S, S(O), $S(O)_2$, or CR^3R^{16};

X^4 is NR^3, O, or S;

Y is —CR^3=CR^3—, —C=C—, —CR^3R^3—X^1—, —X^1—CR^3R^3—, —CR^3R^3—X^1—CR^3R^3]—

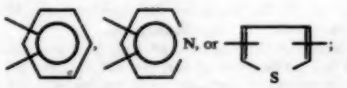
C=O,



O, S, or NR^3;

Z^1 and Z^2 are independently —$CONR^3$—or —HET(—R^3, —R^5)—;

HET is



and the pharmaceutically acceptable salts thereof.

4,962,118

FUNGICIDAL SUBSTITUTED TRIAZOLES

Gerd Kleefeld, and Stefan Dutzmann, both of Duesseldorf, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

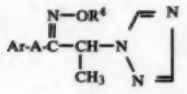
Filed Feb. 15, 1989, Ser. No. 311,327

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1988, 3804981

Int. Cl.[5] A01N *43/653;* **C07D** *249/08*

U.S. Cl. 514—383 **9 Claims**

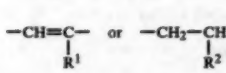
1. A substituted triazole of the formula



in which

Ar stands for aryl which has 6 to 10 carbon atoms and which can be monosubstituted or polysubstituted by identical or different substituents from the group consisting of halogen, cyano, nitro, in each case straight-chain or branched alkyl, alkoxy and alkylthio, each having 1 to 4 carbon atoms, in each case straight-chain or branched halogenalkyl, halogenoalkoxy and halogenoalkylthio, each having 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, in each case straight-chain or branched alkoxycarbonyl and alkoximinoalkyl, each having 1 to 4 carbon atoms in the alkoxy moiety and 1 to 4 carbon atoms in the alkyl moiety, phenyl which is optionally monosubstituted or polysubstituted by identical or different substituents from the group consisting of halogen and straight-chain or branched alkyl having 1 to 4 carbon atoms, phenoxy which is optionally monosubstituted or polysubstituted by identical or different substituents from the group consisting of halogen and straight-chain or branched alkyl having 1 to 4 carbon atoms and by benzyloxy which is optionally monosubstituted or polysubstituted by identical or different substituents from the group consisting of halogen and straight-chain or branched alkyl having 1 to 4 carbon atoms,

A stands for the group



R^1 stands for hydrogen or for straight-chain or branched alkyl having 1 to 4 carbon atoms,

R^2 stands for hydrogen or straight-chain or branched alkyl having 1 to 4 carbon atoms,

R^4 stands for hydrogen, straight-chain or branched alkyl having 1 to 6 carbon atoms or stands for cycloalkyl having 3 to 7 carbon atoms, it being possible for each of the cycloalkyl radicals to be monosubstituted or polysubstituted by identical or different substituents from the group consisting of halogen, straight-chain or branched alkyl having 1 to 4 carbon atoms and straight-chain or branched halogenoalkyl having 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, or stands for aralkyl having 6 to 10 carbon atoms in the aryl moiety and 1 to 4 carbon atoms in the straight-chain or branched alkyl moiety, it being possible for each of the alkyl radicals to be monosubstituted or polysubstituted by identical or different substituents from the group consisting of halogen, cyano, nitro, in each case straight-chain or branched alkyl, alkyloxy or alkylthio, each having 1 to 4 carbon atoms, in each case straight-chain or branched halogenoalkyl, halogenoalkoxy and halogenoalkythio, each having 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, or stands for aryl having 6 to 10 carbon atoms, it being possible for each of the aryl radicals to be monosubstituted or polysubstituted by identical or different substituents from the group consisting of halogen, cyano, nitro, in each case straight-chain or branched alkyl, alkoxy or alkylthio, each having 1 to 4 carbon atoms, in each case straight-chain or branched halogenoalkyl, halogenoalkoxy and halogenoalkylthio, each having 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms,

or an addition product thereof with an acid or metal salt.

4,962,119

TRIAZOLE DERIVATIVES OF FENAMATES AS ANTIINFLAMMATORY AGENTS

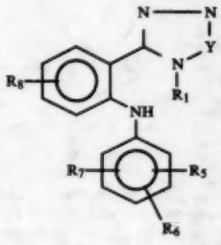
Diane H. Boschelli, Novi; David T. Connor, Ann Arbor, both of Mich.; Daniel L. Flynn, Mundelein, Ill.; Jagadish C. Sircar, and Milton L. Hoefle, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jun. 9, 1989, Ser. No. 364,345

Int. Cl.[5] A61K *31/41*; C07D *249/12, 249/14*

U.S. Cl. 514—384 **9 Claims**

1. A compound of the formula (I)



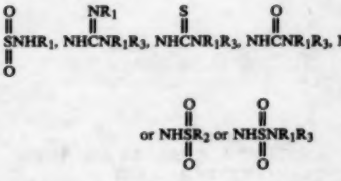
and a pharmaceutically acceptable salt thereof; wherein

R_1 is hydrogen or lower alkyl;

Y is (1) C—SR_1 wherein R_1 is H or lower alkyl (2)

wherein R_2 is lower alkyl, (3)

wherein R_2 is as independently defined above, (4) C—NR_1R_3 wherein R_1 is independently as defined above and R_3 is hydrogen or lower alkyl, (5) COR_1 wherein R_1 is independently as defined above, (6) CR_4 wherein R_4 is hydrogen, lower alkyl,-halogen, CF_3, CO_2R_1, or



wherein R_1, R_2, and R_3 are independently as defined above; and

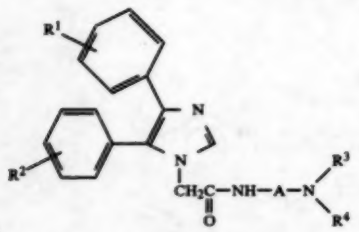
R_5, R_6, R_7, and R_8 are independently hydrogen, fluoro, chloro, bromo, iodo, trifluoromethyl, lower alkyl, CN, hydroxy, lower alkoxy, —$S(O)_n$-lower alkyl, NO_2, or NR_9R_{10} wherein R_9 or R_{10} are independently H, lower alkyl or lower alkanol; and n is an integer of 0 through 2.

4,962,120
1H-IMIDAZOLE-1-ACETAMIDES

Denis M. Bailey, East Greenbush, and Virendra Kumar, Colonie, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Mar. 22, 1989, Ser. No. 327,227
Int. Cl.[5] **C07D** *233/61, 401/12, 403/12;* **A61K** *31/415*
U.S. Cl. 514—399 **13 Claims**

1. A compound of formula



or acid-addition salt thereof wherein R^1 and R^2 are independently hydrogen, hydroxy, lower-alkyl, lower-alkoxy, nitro, or halo; R^3 and R^4 are independently hydrogen, lower-alkyl, or hydroxy lower-alkyl, or R^3 and R^4 together form a straight or branched alkylene chain of four to six carbons; A is $CH_2CH(OH)CH_2$ or $(CH_2)_n$ wherein n is an integer from two to eight.

11. A method for treating cardiac arrhythmias in a susceptible subject which comprises the step of administering an amount of a compound according to claim **1** effective to treat cardiac arrhythmias.

4,962,121
METHOD AND COMPOSITION FOR TREATING NEUROLOGICAL DISEASES SUCH AS MIGRAINE

Anders Hamberger, Torpedgatan 4B, S–421 76, Västra Frölunda, Sweden, and Nico M. Van Gelder, 59, Fountain Drive, Dollard des Ormeaux, Quebec, Canada (H9B 1X9)

Filed Apr. 21, 1988, Ser. No. 184,341
Claims priority, application Sweden, Apr. 22, 1987, 8701662
Int. Cl.[5] **A61K** *31/40*
U.S. Cl. 514—419 **13 Claims**

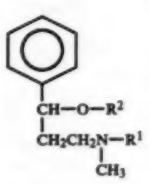
1. A method of treating migraine, comprising administering at least one amino acid selected from the group consisting of taurine, glycine, leucine, carnitine, histidine and proline, in an amount effective to optimize the ability of the nerve cell gliacytes to transport taurine and the ability of the nerve cells to absorb taurine.

4,962,122
ARYLOXYPHENYLPROPYLAMINES AND THEIR PREPARATION AND USE

Palle Jakobsen, Vaerlose, and Jorgen Drejer, Bronshoj, both of Denmark, assignors to A/S Ferrosan, Soborg, Denmark

Filed Nov. 29, 1988, Ser. No. 277,561
Claims priority, application Denmark, Dec. 1, 1987, 6309/87
Int. Cl.[5] **A61K** *31/36, 31/135*
U.S. Cl. 514—466 **10 Claims**

1. An aryloxyphenylpropylamine selected from these having the formula I



(I)

wherein

R^1 is C_{3-7}-cycloalkyl, C_{3-10}-alkyl, or alkenyl straight, branched or cyclic, unsubstituted or substituted with C_{1-4}-alkoxy, aryloxy or cycloalkyl or cycloalkylalkyl; and

R^2 is 3,4-methylenedioxyphenyl, tetrahydronaphthyl, indanyl, which are optionally substituted with one or more halogen, C_{1-6}-alkyl, C_{1-6}-alkoxy, C_{1-6}-alkenyl, trifluoromethyl, C_{3-5}-alkylene, up to C_{10} aryloxy, or up to C_{10} aralkoxy,

and a salt thereof with a pharmaceutically acceptable acid.

4. A pharmaceutical composition suitable for use in preventing calcium overload in brain cells of mammals, including humans, comprising an amount of a compound of claim **1**, which is effective for inhibiting calcium uptake into brain cells together with a pharmaceutically-acceptable carrier or diluent.

4,962,123
THIOCYANATO-BUTENES AS INHIBITORS OF MICROORGANISM GROWTH

Peter W. Austin, Bury, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Aug. 29, 1988, Ser. No. 237,748
Claims priority, application United Kingdom, Sep. 23, 1987, 8722358
Int. Cl.[5] **C07C** *33/00;* **A01N** *47/40*
U.S. Cl. 514—514 **12 Claims**

1. A compound of the formula:

$$X\,CR_1R_2C(Y_1)=C(Y_2)CR_1R_2SCN$$

where

R_1 and R_2, which may be the same or different are hydrogen, a hydrocarbyl group, or a substituted hydrocarbyl group wherein the hydrocarbyl group contains no more than 20 carbon atoms and any substituents are selected from hydrocarboxyl groups, ester groups, halogen atoms or nitrile groups; or

R_1 and R_2, together with a carbon atom to which they are attached form a ring structure which contains not more than six carbon atoms;

X is bromine, chlorine or iodine; and

Y_1 and Y_2, which may be the same or different, are chlorine, bromine or iodine.

9. A method of inhibiting the growth of micro-organisms on, or in, a medium which comprises treating the medium with an effective amount of at least one of the compounds of claim **1** or the composition of claim **7**.

4,962,124
ONSET-HASTENED/ENHANCED ANTIPYRETIC RESPONSE

Abraham Sunshine, New York, and Eugene M. Laska, Larchmont, both of N.Y., assignors to Analgesic Associates, Larchmont, N.Y.

Continuation-in-part of Ser. No. 121,849, Nov. 17, 1987, Pat. No. 4,868,214. This application Aug. 25, 1989, Ser. No. 398,482
Int. Cl.[5] **A61K** *31/19*
U.S. Cl. 514—568 **24 Claims**

1. The method of eliciting an onset-hastened and enhanced antipyretic response in a human mammal suffering from elevated body temperature and in need of such treatment, com-

prising administering to such organism a unit dosage onset-hastening/enhancing antipyretically effective amount of the S(+) ketoprofen enantiomer, and said enantiomer being substantially free of its R(−) ketoprofen antipode.

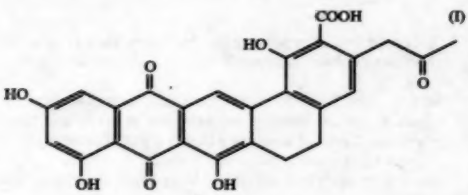
4,962,125

NOVEL SUBSTANCE KS-619-1, PREPARATION PROCESS AND PHARMACEUTICAL COMPOSITION

Hiroshi Kase; Yuzuru Matsuda, both of Koganei; Kunikatsu Shirahata, Komae; Toru Yasuzawa, and Koji Yamada, both of Machida, all of Japan, assignors to Kyowa Hakko Kogyo, Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 787,261, Oct. 15, 1985, abandoned. This application Aug. 24, 1988, Ser. No. 235,654
Claims priority, application Japan, Oct. 15, 1984, 59-215578
Int. Cl.[5] A61K *31/65*; C07C *49/423, 50/36*
U.S. Cl. 514—569 3 Claims

2. KS-619-1, a compound of the Formula I



3. A pharmaceutical composition comprising as active ingredient an effective amount of KS-619-1 in association with at least one pharmaceutically acceptable carrier or excipient.

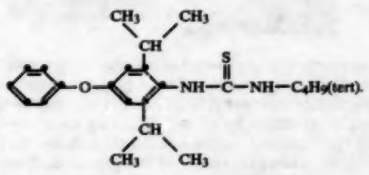
4,962,126

USE OF N-(4-PHENOXY-2,6-DIISOPROPYLPHENYL)-N'-TERT-BUTYLTHIOUREA FOR CONTROLLING WHITE FLIES

Jozef Drabek, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 205,594, Jun. 7, 1988, abandoned, which is a continuation of Ser. No. 882,853, Jul. 7, 1986, abandoned. This application Apr. 28, 1989, Ser. No. 346,361
Claims priority, application Switzerland, Jul. 12, 1985, 3036/85; May 20, 1986, 2019/86
Int. Cl.[5] A01N *47/28*
U.S. Cl. 514—587 6 Claims

1. A method of controlling insects of the family Aleyrodidae which comprises applying to nymphs and adults of said insects or their infected loci, an insecticidally effective amount of the compound



4,962,127

METHOD FOR SILICON REDUCTION WITH DIMERCAPTOSUCCINIC ACID (DMSA)

Harvey C. Gonick; Farhad Khalil-Manesh, both of Los Angeles, and Elmar W. J. Weiler, Inglewood, all of Calif., assignors to Cedars-Sinai Medical Center, Los Angeles, Calif.

Filed Mar. 17, 1989, Ser. No. 325,297
Int. Cl.[5] A61U *31/185*
U.S. Cl. 514—578 14 Claims

1. A method of reducing silicon levels in the blood of a human or other animal requiring such treatment, comprising administering to said human or animal an effective amount of Dimercaptosuccinic Acid.

4,962,128

METHOD OF TREATING ANXIETY-RELATED DISORDERS USING SERTRALINE

Declan P. Doogan, Canterbury, England; Karen A. Scappaticci, and Elizabeth Hackett, both of New York, N.Y., assignors to Pfizer Inc., New York, N.Y.

Filed Nov. 2, 1989, Ser. No. 431,000
Int. Cl.[5] A61K *31/135*
U.S. Cl. 514—647 10 Claims

1. A method of treating an anxiety-related disorder comprising administering to a patient in need of such treatment an amount of the compound (1S-cis)-4-(3,4-dichlorophenyl)-1,2,3,4-tetrahydro-N-methyl-1-naphthalenamine, or a pharmaceutically acceptable salt thereof, effective in preventing or alleviating anxiety and the symptoms associated with such disorder.

4,962,129

TREATMENT OF SYMPTOMS OF NEOPLASTIC DISEASES WITHOUT TREATING THE DISEASES THEMSELVES

Emanuel Revici, New York, N.Y., assignor to Elena Avram, New York, N.Y.

Continuation-in-part of Ser. No. 806,142, Dec. 6, 1985, abandoned. This application Feb. 28, 1986, Ser. No. 834,689
Int. Cl.[5] A61K *31/045, 31/11, 31/12, 31/13*
U.S. Cl. 514—724 4 Claims

1. A method for alleviating the symptoms of a neoplastic disease without treating the disease itself which comprises administering by injection an effective amount of a composition comprising between about 60 and 90 weight percent of a mixture of substantially equal amounts of at least two different compounds selected from the group consisting of 3-pentanol, 3-heptanol, 3-nonanol and 5-nonanol; and between about 10 and 40 weight percent of a vegetable oil, said composition administered to a patient having symptoms of a neoplastic disease to alleviate at least one of said symptoms.

4,962,130

SKIN TREATMENT COMPOSITION CONTAINING GRANULAR PARTICLES

Takeshi Yanagida, and Isao Murotani, both of c/o Shiseido Laboratories, 1050, Nippa-cho, Kohoku-ku, Yokohama-shi, Kanagawa-ken, Japan

Continuation of Ser. No. 722,563, Apr. 11, 1985, abandoned. This application Aug. 1, 1986, Ser. No. 893,077
Claims priority, application Japan, Apr. 18, 1984, 59-78004
The portion of the term of this patent subsequent to Oct. 9, 2005 has been disclaimed.
Int. Cl.[5] A61K *7/02, 7/48*
U.S. Cl. 514—846 8 Claims

1. In an aqueous, an oil, an O/W emulsion or a W/O emulsion skin cleansing or massaging treatment compositions including a skin treatment composition base containing therein cosmetically acceptable granular particles of a substance which is insoluble in the skin treatment composition base, wherein the improvement comprises said granular particles having a particle size of 0.05 to 2.0 mm and said granular particles being

prepared by granulating said substance having a powder particle size of 0.1 mm or less with a water-insoluble or oil resistant binder, whereby the granulated particles gradually decrease in size during the application of the composition to the skin.

4,962,131

COMPOSITION USEFUL IN PROCESS FOR PREPARING POWADIR MEMBRANES FROM TETRAHALOBISPHENOL A POLYCARBONATES

Henry N. Beck, Walnut Creek; Edgar S. Sanders, Jr., Pittsburg, and G. Glenn Lipscomb, II, Walnut Creek, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 6, 1987, Ser. No. 118,141
Int. Cl.[5] C08L 69/00
U.S. Cl. 521—51 22 Claims

1. A composition useful for preparing a membrane comprising a tetrahalogenated bisphenol polycarbonate which comprises:

(A) a bisphenol polycarbonate wherein at least 25 percent by weight of the bisphenol moieties are tetrahalogenated wherein the halogen is chlorine or bromine which polycarbonate is polymerized to the extent that the polycarbonate will form a membrane with sufficient mechanical strength to withstand use conditions;

(B) a solvent for the polycarbonate which dissolves at least about 5 weight percent of the polycarbonate present at the membrane extrusion temperature and which comprises at least one compound selected from the group consisting of a glycol ether which corresponds to the formula $R^3O-(CH_2CH_2O)_r-R^3$ wherein R^3 is methyl or ethyl, and r is an integer of between about 1 and 20; morpholine substituted on the nitrogen atom with an alkyl, formyl, or alkanoyl moiety; an unsubstituted or N-C_{1-4} alkyl, N-C_{5-6} cycloalkyl, or N-C_{6-10} aryl or alkaryl substituted pyrrolidinone; C_{1-4} alkoxycarbonyl, formyl, nitro, or halo substituted benzene; dimethylformamide, cyclohexanone; N,N-dimethyl acetamide; acetophenone; sulfolane; cyclohexyl acetate; 1,1,3,3-tetramethylurea; isophorone; caprolactone; 1-formylpiperidine; methyl salicylate; hexamethylphosphoramide; phenyl ether; and bromonaphthalene; and

(C) a non-solvent for the polycarbonate which dissolves less than about 5 weight percent of the polycarbonate present at the membrane extrusion temperature, which is soluble in the solvent for the polycarbonate, and which aids in the formation of pores, and which comprises at least one compound selected from the group consisting of a glycol or glycol ether which corresponds to the formula $R^4O-(CH_2CH_2O)_q-R^4$ wherein R^4 is separately in each occurrence hydrogen or C_{1-4} alkyl, and q is an integer of about 1 to about 250; an ester corresponding to the formula R^5COOR^6 wherein R^5 is hydrogen or C_{1-19} alkyl, and R^6 is C_{1-10} alkyl; a C_{1-10} alkanol; cyclohexane, unsubstituted or substituted with an alkyl, cycloalkyl, or perfluoralkyl moiety; a C_{5-20} alkane; a dialkyl ketone wherein at least one of the alkyl moieties is C_3 or greater; an amide corresponding to the formula R^7CONHR^8 wherein R^7 is hydrogen or C_{1-10} alkyl and R^8 is C_{1-10} alkyl; an acetyl or C_{1-10} alkyl nitrile; acetone; a C_{1-10} alkyl aldehyde; a trialkyl amine; nitromethane; trialkyl ortho-formate; diacetone alcohol; dimethyl malonate; decahydronaphthalene; tetrahydronaphthalene; malononitrile; ethylene carbonate; sulfolane; alkyl or cycloalkyl substituted benzene; and water;

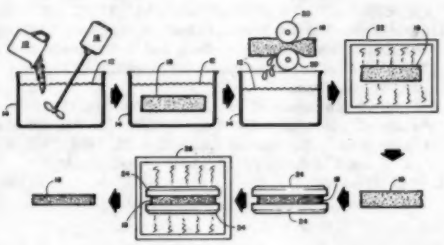
wherein the composition is useful for the preparation by a wet extrusion process of a membrane which has one or more porous regions and one or more discriminating regions capable of separating one or more gases from one or more other gases.

4,962,132

METHOD OF IMPROVING FOAM FIRE RESISTANCE THROUGH THE INTRODUCTION OF INORGANIC PARTICLES THEREINTO

Francis U. Hill, and Lola E. Crosswhite, both of San Diego, Calif., assignors to Sorrento Engineering Corporation, National City, Calif.

Continuation-in-part of Ser. No. 373,900, Jun. 3, 1989. This application Dec. 11, 1989, Ser. No. 448,540
Int. Cl.[5] C08J 9/40
U.S. Cl. 521—55 7 Claims



1. The method of improving the flame resistance of an open-cell polyimide resin foam products which comprises the steps of:

adding very finely divided non-metallic inorganic particles which are gel forming and insoluble in water and polar organic liquid, to water or a highly polar organic liquid to form a gel;

placing an open-cell polyimide resin foam product in said gel;

manipulating said foam product so as to substantially entirely fill said cells with gel;

removing said foam product; and

drying said foam product;

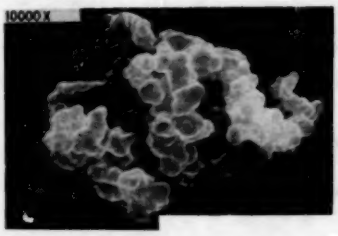
whereby said inorganic particles remain dispersed throughout said cells.

4,962,133

METHOD OF MAKING HIGHLY ADSORPTIVE COPOLYMERS

Richard C. Chromecek, Litchfield, Conn.; Milan F. Sojka, Walden, N.Y.; William L. Klein, Belleville, N.J., and Walter J. Carmody, Port Jervis, N.Y., assignors to Dow Corning Corporation, Midland, Mich.

Filed Sep. 5, 1989, Ser. No. 402,321
Int. Cl.[5] C08J 9/16
U.S. Cl. 521—56 10 Claims



1. A precipitation polymerization process for producing a macroporous cross-linked polymer powder comprising dissolving an inorganic catalytic initiator in an aqueous medium, forming an azeotrope by contacting the aqueous medium containing the dissolved inorganic catalytic initiator with an organic liquid, adding the azeotrope to a reactor equipped with a stirrer, adding at least one polyunsaturated monomer to the

reactor and dissolving the monomer in the azeotrope, the organic liquid being a solvent for the monomer but not for the polymer, initiating the polymerization, conducting the polymerization in the reactor by stirring the azeotrope and the polyunsaturated monomer at stirring rates in the reactor of from about seventy-five revolutions per minute to below about three hundred revolutions per minute, and precipitating a polymer in the azeotrope in the form of a powder including unit particles, agglomerates, and aggregates.

4,962,134

DENTAL IMPRESSION MATERIAL

Heidrun Ott, Wiesbaden-Auringen, and Werner Kuhlmann, Mainz-Hechtsheim, both of Fed. Rep. of Germany, assignors to Blendax GmbH, Mainz, Fed. Rep. of Germany

Continuation of Ser. No. 881,797, Jul. 3, 1986, Pat. No. 4,891,390. This application Jul. 14, 1989, Ser. No. 380,017

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1985, 3525054

Int. Cl.[5] A61K *6/10*; C08G *77/06*; A01N *1/02*

U.S. Cl. 523—109 **10 Claims**

1. A method of making a dental impression which comprises:

(a) mixing at least one crosslinkable organo-silicone, at least one aluminum salt of a C_{12}–C_{18} fatty acid, and an inorganic filler to form a first phase;

(b) mixing a catalyst and a crosslinking agent to form a second phase;

(c) mixing said first phase with said second phase to form a dental impression material composition; and

(d) making said dental impression.

10. In a method for making a dental impression with a dental impression composition the improvement comprising:

(a) mixing at least one crosslinkable organo-silicone, at least one aluminum salt of a C_{12}–C_{18} fatty acid, and an inorganic filler to form a first phase;

(b) mixing a catalyst and a crosslinking agent to form a second phase; and

(c) mixing said first phase with said second phase to form said dental impression composition.

4,962,135

SELF POLISHING ANTI-FOULING PAINTS

Jozef Braeken, Denderleeuw; Jean-Paul Dekerk, Heverlee, both of Belgium; Hendrik van der Poel, Amstelveen, Netherlands; Jozef Verborgt, Uithoorn, Netherlands, and Peter Haak, Heiloo, Netherlands, assignors to Labofina, S.A., Brussels, Belgium

Filed Apr. 28, 1988, Ser. No. 187,104

Claims priority, application United Kingdom, Apr. 28, 1987, 8710024; Feb. 19, 1988, 8803948

Int. Cl.[5] C09D *5/14*, *5/16*; C08K *3/20*, *3/24*

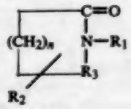
U.S. Cl. 523—122 **26 Claims**

1. A marine paint composition comprising:

(i) a compound selected from the group consisting of sparingly soluble organic acids, sparingly soluble metal salts of organic acids, and mixtures thereof;

(ii) a copolymer prepared by the polymerization of

(a) about 5 to 40 wt. % of at least one monomer A of the general formula



wherein R_1 is selected from the group consisting of hydrogen and alkyl groups when R_2 is an alkenyl group, R_1 is an alkenyl group when R_2 is selected from the group consisting of hydrogen and alkyl groups, R_3 is selected from the group consisting of methylene carbonyl and n is a positive integer,

(b) about 5 to 45 wt. % of at least one acrylic comonomer B wherein the amount of monomers A + B is from about 15 to 75 wt. % of the total monomers in the polymer, and

(c) about 25 to 85 wt. % of at least one comonomer C selected from the group consisting of C_1–C_4 alkyl methacrylates and styrene;

(iii) at least one sparingly soluble metalliferous pigment; and

(iv) at least one marine biocide;

wherein the weight ratio of said compound (i) to said polymer (ii) is between about 1:50 and 70:30; and

wherein said compound (i) contains a carboxyl group or the metal salt of a carboxyl group.

4,962,136

ELASTOMER-PTFE COMPOSITIONS, ADDITIVES, AND MANUFACTURING METHODS

William E. Peters, Danville, Ind., assignor to Alphaflex Industries, Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 45,780, Apr. 29, 1987, which is a continuation of Ser. No. 806,504, Dec. 9, 1985, abandoned, which is a continuation-in-part of Ser. No. 642,128, Aug. 17, 1984, Pat. No. 4,596,839, which is a continuation-in-part of Ser. No. 499,349, May 31, 1983, abandoned, which is a continuation-in-part of Ser. No. 309,230, Sep. 16, 1981, abandoned. This application Apr. 25, 1988, Ser. No. 185,535

The portion of the term of this patent subsequent to Jun. 24, 2003, has been disclaimed.

Int. Cl.[5] C08K *7/00*

U.S. Cl. 523—220 **14 Claims**

1. An additive, consisting essentially of:

a fibrillatable particulate polytetrafluoroethylene and particulate molybdenum disulfide, said particulate molybdenum disulfide having particle sizes substantially smaller than the average particle size of said particulate polytetrafluoroethylene with a substantial majority of the molybdenum disulfide particles having sizes less than about one-tenth the median particle size of the fibrillatable particulate polytetrafluoroethylene, said particulate molybdenum disulfide particles being in substantial part adherent to said fibrillatable particulate polytetrafluoroethylene.

4,962,137

FLAME SPRAYABLE EPOXY COATING COMPOSITIONS

Osborne K. McKinney; Randy S. Moore, and James E. Werall, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 22, 1989, Ser. No. 326,932

Int. Cl.[5] C08L *63/00*

U.S. Cl. 523—400 **30 Claims**

1. An epoxy resin based powder coating composition comprising

(A) a melt blended, pre-reacted component comprising

(1) from about 75 to about 98 percent by weight of at least one solid epoxy resin having a degree of polymerization of from about 0 to about 7; and

(2) from about 2 to about 25 percent by weight of at least one olefinic polymer containing from about 0.1 to about 55 percent by weight of at least one group reactive with vicinal epoxy groups:

(B) a melt blended, pre-reacted component comprising

(3) from about 10 to about 60 percent by weight of at least one solid epoxy resin having a degree of polymerization of from about 1 to about 6; and

(4) from about 40 to about 90 percent by weight of at least one olefinic polymer containing from about 0.1 to about 55 percent by weight of at least one group reactive with vicinal epoxy groups; and

(C) a melt blended, non-reacted composition comprising

(5) from about 40 to about 90 percent by weight of at least one solid epoxy resin having a degree of polymerization of from about 1 to about 10;

(6) from about 10 to about 60 percent by weight of at least one inorganic filler; and

wherein

(a) component (A) is present in an amount of from about 20 to about 45 percent by weight based upon the combined weight of components (A), (B) and (C);

(b) component (B) is present in an amount of from about 12 to about 36 percent by weight based upon the combined weight of components (A), (B) and (C); and

(c) component (C) is present in an amount of from about 19 to about 68 percent by weight based upon the combined weight of components (A), (B) and (C).

4,962,138

REACTIVE HOT MELT STRUCTURAL ADHESIVE

Michael E. Kimball, Westbrook, Me., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Filed May 27, 1988, Ser. No. 199,491

Int. Cl.[5] C08L *63/02*

U.S. Cl. 523—428 **12 Claims**

1. Composition comprising, in parts by weight

(1) Premix A, 50–1000 parts;

(2) Epoxy resin mixture consisting of epoxy resin B and epoxy resin C in a weight ratio of about 3:1, 10–500 parts;

(3) Epoxy resin D,10–200 parts;

(4) Calcium silicate powder, 0–200 parts;

(5) only one member of the group consisting of CaO and a Schiff base, wherein if CaO is used, 10–100 parts and if a Schiff base is used, 5–50 parts;

(6) Fumed silica, 0–80 parts;

(7) Phenolic resin, softening point 190°–290° F., non-heat reactive, 5–100 parts;

(8) $Zn_3(PO_4)_2$, 5–100 parts;

(9) Mixture, about 2:1 by weight, of Epoxy resin D and dicyandiamide, 5–150 parts;

(10) Glycidyl trimethyl silane, 1–10 parts;

(11) $CaCO_3$ powder, 0–200 parts;

where Premix A comprises in parts by weight,

(i) about 4000 g/mole ethylene oxide end-capped polypropylene glycol triblock copolymer containing primary —OH groups, 5–100 parts;

(ii) about 4000 g/mole polypropylene glycol homopolymer, with secondary —OH groups, 0–50 parts;

(iii) phenyl diethanolamine, 0–2 parts;

(iv) about 50:50 weight diphenylmethane diisocyanate/tripropylene glycoldiphenyl methane diisocyanate adduct, 5–20 parts, the amount being further selected such that the molecular ratio of —NCO/(polyol —OH) is greater than 1 and less than 2 wherein the hydroxyl groups are from the polyols found in (i), (ii) and (iii) above;

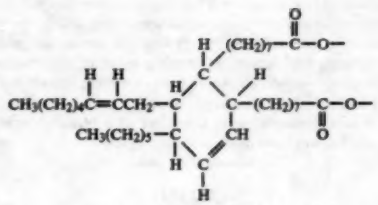
(v) Epoxy resin C, 0–50 parts;

(vi) Epoxy resin B, 10–50 parts;

where Epoxy resin B is

where

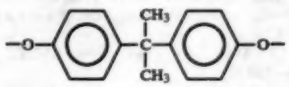
X is:



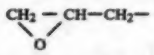
Y is —R—K—Q

R is $-CH_2CH(OH)CH_2-$

K is



Q is



Epoxy resin C is Q—K—(—R—K—)$_n$—Q wherein n=2–4;

Epoxy resin D is Q—K—Q; and

Provided that the total of calcium silicate, fumed silica, and calcium carbonate is in the range of about 10–30 weight % of the total composition.

4,962,139

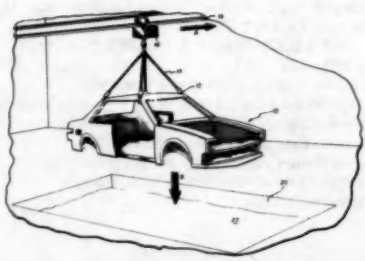
CONDUCTIVE PRIMER COMPOSITIONS WITH PRIMARY RESIN BINDER

Salvador R. Lo, Blue Island, Ill., assignor to W. C. Richards Company, Blue Island, Ill.

Continuation-in-part of Ser. No. 61,084, Jun. 12, 1987, abandoned, which is a division of Ser. No. 922,318, Oct. 23, 1986, Pat. No. 4,715,012, which is a continuation-in-part of Ser. No. 829,112, Feb. 28, 1986, abandoned. This application Jan. 29, 1988, Ser. No. 150,375

Int. Cl.[5] C08L *63/00*; H01B *1/04*

U.S. Cl. 523—468 **7 Claims**



1. An electroconductive coating composition comprising a substantially uniform dispersion of:

approximately 70%–90% by weight of solids of a curable, film-forming polymeric primary resin binder which, upon cure, will form a stable film to adhere to the surface of a substrate;

approximately 10%–30% by weight of solids of a conductive carbon pigment;

a sufficient weight of an electron transmitting surfactant to

provide in the cured film conductive pathways for electrons between the conductive pigment particles;
and sufficient solvents to provide a flowable viscosity to said composition.

4,962,140

PROCESS FOR PRODUCING CELLULOSIC DIALYSIS MEMBRANES HAVING IMPROVED BIOCOMPATIBILITY AND DEVICE FOR CARRYING OUT THE PROCESS

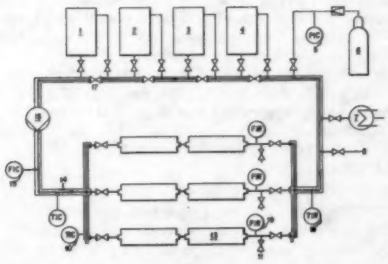
Michael Diamantoglou, Erlenbach, Fed. Rep. of Germany, assignor to Akzo N.V., Arnhem, Netherlands

Filed Apr. 28, 1989, Ser. No. 344,967

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1988, 3814326

Int. Cl.[5] B01D *67/00*

U.S. Cl. 524—35 **17 Claims**



1. A process comprising: chemically modifying of cellulosic dialysis membranes in the form of flat films, tubular films or tubular filaments, by, providing properties sufficient for providing properties sufficient for providing a C5A reduction of up to 100%, by

contacting at least one surface of a cellulosic membrane with a solution of a polar solvent having dissolved therein a preselected concentration of at least one monomer selected from the group consisting of acid chlorides, acid andydrides, acids, esters, ketenes, diketenes, chloroformic acid esters, carbonic acid diesters, 2,5-diketooxazolidines, isatinic anhydride, isocyanates, carbamoyl chlorides, thiocyanates, thiocarbamoyl chlorides, sulfonyl chlorides, sulfonic acid anhydrides, N-chlorosulfonamides, sulfinic acid chlorides, N-chlorosulfinamides, phosphoric acid anhydride, phosphonic acid anhydrides, phosphonic acid chlorides, phosphorous acid, phosphinic acid anhydrides, ethylene oxide, ethylene sulfide, ethyleneimino, lactone, sultone, cleavable onium compounds, alkylaminoethanol sulfate esters, alkylsulfonethanol sulfate esters, vinylsulfonic acid, a salt of vinylsulfonic acid, vinylsulfonic acid esters, vinylphosphonic acid, or a salt of vinylphosphonic acid, vinylphosphonic acid esters, allylsulfonic acid, a salt of allylsulfonic acid, allylsulfonic acid esters, allylphosphonic acid, a salt of allylphosphonic acid, allylphosphonic acid esters, acrylamide, methacrylamide, acrylic acid, a salt of acrylic acid, acrylic acid esters, methacrylic acid, a salt of methacrylic acid, methacrylic acid esters, acrylonitrile, crotonic acid, a salt of crotonic acid, crotonic acid esters, crotonic acid nitrile, and mixtures thereof.

13. An apparatus comprising means for chemically modifying cellulosic dialysis membranes in the form of flat films, tubular films or tubular filaments, including, a piping system which is in communication with at least one storage tank for liquid or gas and with at least one membrane module, and a conveying means to maintain a liquid circulation, wherein the piping system is a ring circuit to which the storage tank is attached through a proportioning device adapted to supply said liquid or gas at a predesignated time and in a predesignated quantity from said storage tank through the ring circuit to said membrane module.

4,962,141

ETHYLENE-VINYL CHLORIDE COPOLYMER EMULSIONS CONTAINING TETRAMETHYLOL GLYCOLURIL FOR USE AS BINDER COMPOSITIONS

John G. Iacoviello; George Davidowich, both of Allentown; Bheema R. Vijayendran, Emmaus, and John S. Sadowski, Kutztown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 20, 1989, Ser. No. 326,144

Int. Cl.[5] C08K *5/34*

U.S. Cl. 524—92 **11 Claims**

1. A copolymer emulsion comprising an aqueous colloidal dispersion containing (a) 20% to 70% solids of a copolymer consisting essentially of 65 to 90wt% vinyl chloride and 5 to 35 wt% ethylene prepared in the presence of a stabilizing system consisting essentially of 3 to 15 wt% polyvinyl alcohol which is 70 to 91 mole% hydrolyzed and (b) 4 to 10 wt% tetramethylol glycoluril based upon the weight of the emulsion copolymer.

4,962,142

REACTIVE, NON-YELLOWING TRIAZINE COMPOUNDS USEFUL AS UV SCREENING AGENTS FOR POLYMERS

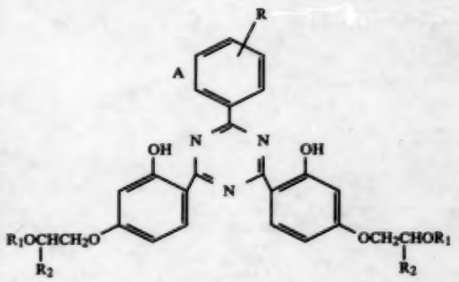
Cyril A. Migdal; John B. Hines, both of Spartanburg, and Edward W. Kluger, Pauline, all of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 139,342, Dec. 29, 1987, Pat. No. 4,826,978. This application Nov. 14, 1988, Ser. No. 270,871

Int. Cl.[5] C08K *5/3492*; C08F *8/00*; C08G *18/32*

U.S. Cl. 524—100 **7 Claims**

1. A polymer composition stabilized against the deleterious effects of UV light which comprises a polymer having reacted therein a total of from about 0.05 to about 5 percent by weight of at least one UV absorbing compound of the formula:



where R is an electron withdrawing group; R_1 is H,

where R_3 is an alkyl group having from one to 6 carbon atoms; and R_2 is selected from H and CH_3.

4,962,143

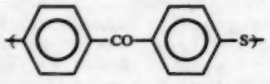
POLY(ARYLENE THIOETHER) BLOCK COPOLYMER FIBERS AND PRODUCTION PROCESS THEREOF

Yoshikatsu Satake, Iwaki; Shinji Yamamoto, Urawa; Takashi Kaneko, Tokyo; Masaki.to Tada, Matsudo; Ken Kashiwadate, Iwaki; Toshiya Mizuno, Tsuchiura; Hiroyuki Endo, Ibaraki; Takayuki Katto, Iwaki, and Zenya Shiiki, Narashino, all of Japan, assignors to Kureha Kagaku Kogyo K.K., Tokyo, Japan

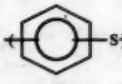
Filed Oct. 20, 1989, Ser. No. 424,638
Claims priority, application Japan, Oct. 25, 1988, 63-267290; Nov. 15, 1988, 63-286836; Sep. 26, 1989, 1-248086
Int. Cl.[5] C08K 5/35; C08F 283/00; C08G 14/00
U.S. Cl. 524—100 8 Claims

1. Poly(arylene thioether) block copolymer fibers formed by melt-spinning of a thermoplastic material comprising:

(A) 100 parts by weight of a poly(arylene thioether) block copolymer (Component A) alternately comprising (X) at least one poly(arylene thioetherketone) block having predominant recurring units of the formula



wherein the —CO— and —S— are in the para position to each other and (Y) at least one poly(arylene thioether) block having predominant recurring units of the formula



(a) the ratio of the total amount of the poly(arylene thioether) block (Y) to the total amount of the poly(arylene thioether-ketone) block (X) ranging from 0.05 to 5 by weight,

(b) the average polymerization degree of the poly(arylene thioether) block (Y) being at least 10, and

(c) said block copolymer having a melt viscosity of 50–100,000 poises as measured at 350° C. and a shear rate of 1,200/sec;

(B) optionally, up to 50 parts by weight of at least one other thermoplastic resin (Component B); and

(C) optionally, up to 10 parts weight of at least one filler (Component C).

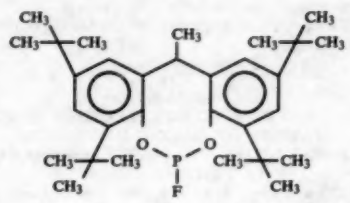
4,962,144

COMPOSITION

Robert C. Babillis, Mt. Vernon; Stanley V. Martin, Cynthiana, and Randall A. Reed, Mt. Vernon, all of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 30, 1988, Ser. No. 292,165
Int. Cl.[5] C08K 5/49, 5/527
U.S. Cl. 524—118 5 Claims

1. A composition comprising an aromatic polycarbonate in admixture with an anti-yellowing effective amount of a compound of the formula



4,962,145

PARTIAL ESTER RELEASE AGENTS FOR PLASTICS

Kurt Worschech, Loxstedt; Erwin Fleischer, Bremerhaven-Spaden; Peter Wedl, Bremerhaven; Frido Loeffelholz, Bremerhaven-Surheide, and Ernst-Udo Brand, Bremerhaven, all of Fed. Rep. of Germany, assignors to Neynaber Chemie GmbH, Loxstedt, Fed. Rep. of Germany

Continuation of Ser. No. 136,320, Dec. 22, 1987, abandoned. This application Dec. 9, 1988, Ser. No. 282,888
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643968
Int. Cl.[5] C07C 69/33; C08K 5/10
U.S. Cl. 524—310 14 Claims

1. A partial ester containing on average at least 1 free hydroxyl group which is an ester of at least one saturated, linear C_{22}–C_{34} montanic acid esterified with diglycerol.

5. A molding composition comprising a vinyl chloride homo- or co-polymer and a release agent consisting essentially of a partial ester containing on average at least 1 free hydroxyl group which is an ester of at least one saturated, linear C_{22}–C_{34}-montanic acid esterified with glycerol or diglycerol in an amount sufficient to promote release of the composition from a mold.

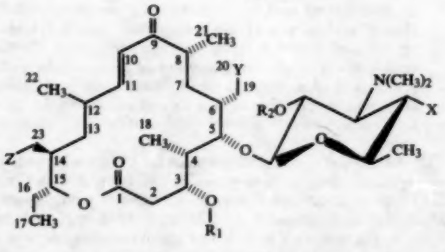
4,962,146

3-O-GLYCOSYL 16-MEMBERED MACROLIDE ANTIBACTERIALS AND RELATED DERIVATIVES

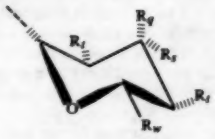
Alan K. Mallams, West Orange; Randall R. Rossman, Nutley; Olga Sarre, Verona; Vlyyoor M. Girijavallabhan, Parsippany, and Ashit K. Ganguly, Upper Montclair, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation of Ser. No. 44,076, Apr. 29, 1987, abandoned. This application Oct. 14, 1988, Ser. No. 259,455
Int. Cl.[5] A61K 31/70; C07H 17/08
U.S. Cl. 514—30 34 Claims

1. A compound represented by the formula I:

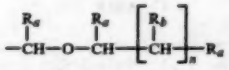


wherein R_1 is a glycosyl group represented by the formula II:



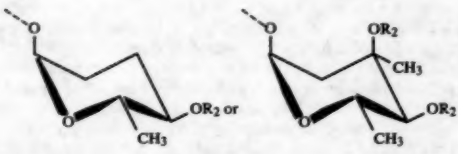
wherein R_q and R_f are indepeadently hydrogen, hydroxy, acyloxy, loweralkoxy, lower alkoxy substituted by phenyl or biphenyl, N-loweralkylaminocarbonyloxy, N-aralkylamino carbonyloxy or arylsulfonyloxy (—OSO_2Ar) and R_s and R_w are indepeadently hydrogen, lower alkyl or —CH_2OH; with the proviso that at least one of R_q, R_s, R_f or R_w is not hydrogen; pr represented by teh formual IIA:

IIa



wherein R_q is hydrogen, lower alkyl, or CH_2OH and R_b is hydrogen, hydroxy, acyloxy, loweralkoxy, loweralkoxy substituted by phenyl or biphenyl, N-loweralkylaminocarbonyloxy, N-aralkylaminocarbonyloxy or arylsulfonyloxy and n is 1, 2, 3 or 4;

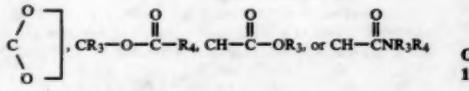
R_2 is hydrogen or an acyl group pg.1 X is hydrogen, hydroxyl, an acyloxy group



wherein R_2 is defined as hereinabove;

Y is hydrogen, a formyl group, methyl, HC=NNH-aralkyl, wherein aralkyl is lower alkyl substituted by phenyl or biphenyl

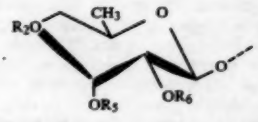
wherein m is 0, 1 or 2 and Q is independently CR_3R_4, NR_3, O, S, SO_2, CR_3OR_4,



wherein R_3 and R_4 are independently hydrogen, lower alkyl, lower alkyl substituted by phenyl or biphenyl, G-substituted -(lower alkyl substituted by phenyl or biphenyl), phenyl or biphenyl and G-substituted-(phenyl or biphenyl); wherein G is independently one or more of halogen, trifluoromethyl, lower alkoxy or (C_{2-C7}) alkanoyl;

is a 12,13 double bond or a 12,13-oxo moiety;

Z is hydrogen, hydroxy, a acyloxy group, a N,N-di(loweralkyl) amino group or,



loweralkoxycarbonyloxy, aralkoxycarbonyloxy, N-lowralkylaminocarbonyloxy, and N-aralkylaminocarbonyloxy wherein aralkoxy in aralkoxycarbonyloxy is lowralkoxy substituted by phenyl or biphenyl, aralkyl in N-aralkylaminocarbonyloxy is loweralkyl substituted by phenyl or biphenyl, R_2 is defined above and R_5 and R_6 are independently hydrogen, lower alkyl or acyl groups; or a pharmaceutically acceptable acid addition salt thereof.

34. A method of eliciting an antibacterial effect against a susceptible bacterial infection which comprises administering to an animal having a susceptible bacterial infection an antibacterially effective amount of a compound of claim 1 alone or a compound of claim 1 in admixture with a pharmaceutically acceptable carrier therefor.

4,962,147

PROCESS FOR THE SUSPENSION POLYMERIZATION OF 4-ACETOXYSTYRENE AND HYDROLYSIS TO 4-HYDROXYSTYRENE POLYMERS

Richard Vicari, Corpus Christi, Tex., assignor to Hoechst Celanese Corporation, North Sommerville, N.J.

Filed May 26, 1988, Ser. No. 199,553

Int. Cl.[5] C08F 8/12

U.S. Cl. 524—460 **28 Claims**

1. A process for preparing an aqueous suspension of poly(4-acetoxystyrene) which comprises:

(a) forming a suspension of about 5 to about 30 weight percent 4-acetoxystyrene monomer in water, wherein said weight percent is based on the weight of monomer and water, in the presence of polyacrylic acid and at least two free-radical polymerization catalysts wherein one catalyst has a half life of one hour at a temperature below 100° C. and the other has a half life of one hour at a temperature above 100° C.;

(b) heating the suspension at a temperature of about 70 ° C. to about 95° C. until the conversion of monomer to polymer is at least about 50 percent by weight; and

(c) heating the suspension at a temperature above 95° C. to about 100° C. until the conversion of monomer to polymer is substantially complete.

4,962,148

THERMOPLASTIC RESIN COMPOSITION AND METHOD FOR PREPARING THE SAME

Yuichi Orikasa, Yokohama; Suehiro Sakazume, Fujisawa; Sadahiro Nishimura, Kawasaki, and Yoshinori Maki, Chigasaki, all of Japan, assignors to Nippon Petrochemicals Co., Ltd and Nippon Oil & Fats Co., Ltd., both of Tokyo, Japan

Filed Sep. 8, 1988, Ser. No. 242,025

Claims priority, application Japan, Sep. 9, 1987, 62-226161; Oct. 2, 1987, 62-250174; Oct. 13, 1987, 62-257682; Dec. 29, 1987, 62-332281; Feb. 25, 1988, 63-42593

Int. Cl.[5] C08L 77/00, 71/04, 69/00, 55/02

U.S. Cl. 524—504 **21 Claims**

1. A thermoplastic resin composition consisting essentially of:

(I) 99 to 1% by weight of a polypropylene,

(II) 1 to 99% by weight of at least one resin selected from the group consisting of an aromatic polyester resin, a polycarbonate resin, a polyamide resin, a polyphenylene ether resin, a mixture of the polyphenylene ether resin and a styrene polymer, and an ABS resin, and

(III) 0.1 to 100 parts by weight, based on 100 parts by weight of the aforesaid resins (I)+(II), of a multi-phase structure thermoplastic resin which is composed of 5 to 95% by weight of a polyolefin or olefin copolymer and 95 to 5% by weight of a vinyl polymer or copolymer obtained from at least one vinyl monomer, wherein said multi-phase structure thermoplastic resin is a graft polymerization precursor obtained by copolymerizing at least one vinyl monomer and at least one radical polymerizable or copolymerizable organic peroxide in particles of the polyolefin or olefin copolymer, or a multi-phase structure resin obtained by melting and kneading the graft polymeriza-

tion precursor, and wherein at least one of the components of the multi-phase structure thermoplastic resin is present in a dispersion phase having a particle diameter of 0.001 to 10 μm.

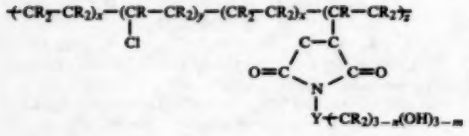
4,962,149

MODIFIED CHLORINATED POLYOLEFINS

Slaton E. Fry, Batesville; David W. Magouyrk, Locust Grove; Allen J. Blankenship, Batesville, all of Ark., and Paul J. Greene, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 7, 1989, Ser. No. 432,632
Int. Cl.[5] C08L 39/00; C08F 265/10
U.S. Cl. 524—555 4 Claims

1. A composition of a paint and a polyolefin having repeating units of the structure:



wherein m=0, 1 or 2; n=0, 1, 2 or 3; R is H or a hydrocarbyl radical having in the range of 1 up to 20 carbon atoms; and Y is a hydrocarbyl moiety having in the range of 1 up to 20 carbon atoms; wherein each of x, y, and z can vary in the range of about 0 up to 1,000 so that the resulting polymer has a number average molecular weight in the range of about 2,000 up to 40,000, and wherein the ratio of x:y can vary from about 1:1 up to about 4:1, the ratio of x:z can vary from about 20:1 up to about 50:1, and the ratio of y:z can vary from about 10:1 up to about 20:1.

4,962,150

POLYMERIC STABILIZERS, THEIR PREPARATION AND DISPERSIONS CONTAINING THEM

Adrian S. Allen, Skipton, Great Britain, assignor to Allied Colloids Ltd., United Kingdom

Filed Mar. 17, 1989, Ser. No. 325,197
Claims priority, application United Kingdom, Mar. 18, 1988, 8806541
Int. Cl.[5] C08L 77/00
U.S. Cl. 524—602 13 Claims

1. In a dispersion of organic polymeric particles in a substantially non-polar, organic, water immiscible liquid containing an oil soluble surfactant as a dispersion stabiliser wherein the dispersion has been made by a process comprising reverse phase polymerisation, the improvement which comprises using, as said oil soluble surfactant, a reaction product of an oil soluble polyester carboxylic acid having molecular weight greater than 1500, with a water soluble polyamine that has molecular weight above 500 and that contains at least 5 basic nitrogen atoms and wherein the molar ratio carboxylic acid groups : amine groups is 1:1 to 1:3.

4,962,151

SILICONE SEALANT COMPOSITIONS

Frank A. Mellon, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jun. 22, 1989, Ser. No. 370,361
Int. Cl.[5] C08K 3/14
U.S. Cl. 524—788 10 Claims

1. A composition of polymer and filler having improved extrusion properties consisting essentially of

(A) 100 parts by weight of polymer having a degree of polymerization of at least 200,

(B) from 0 to 5 parts by weight of plasticizer,

(C) from 50 to 150 parts by weight of filler mixture, the filler mixture comprising from 0.5 to 50 percent by weight of a large particle size filler having an average particle diameter of from 0.5 to 10 micrometers and from 50 to 99.5 percent by weight of a small particle size filler having an average particle diameter of less than 0.1 micrometers, the large particle size filler having an average particle diameter of at least 10 times the average particle diameter of the small particle size filler, and

(D) optionally, a cure system for the polymer (A).

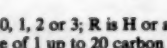
4,962,152

CURABLE FILLED POLYSILOXANE COMPOSITIONS

Patrick Leempoel, Brussels, Belgium, assignor to Dow Corning S. A., Seneffe, Belgium

Filed Feb. 9, 1990, Ser. No. 477,394
Claims priority, application United Kingdom, Feb. 22, 1989, 8904082
Int. Cl.[5] C08K 3/18
U.S. Cl. 524—788 15 Claims

1. A curable composition (A) the product formed by mixing 100 parts by weight of a hydroxypolysiloxane with from 5 to 12 parts by weight of a curing agent therefore comprising a silane of the formula $R_aR'_bSi$ or a siloxane having units



wherein each R represents a monovalent hydrocarbon group, each R' represents an hydroxy, alkoxy, or alkoxyalkoxy group, a+b=4, a has a value 0 or 1, b has a value 3 or 4, c has a value 1, 2 or 3 and a+c is not greater than 3, (B) from 50 to 200 parts by weight of a filler comprising a mixture of 10to 80% by weight of the mixture of a calcium carbonate composed principally of particles having a surface area from 10 m^2/g to 30 m^2/g and 20 to 90% by weight of the mixture of a calcium carbonate composed principally of particles having a surface area from 0.5 m^2/g to 12 m^2/g and (C) a catalytic amount of a titanium or tin compound for promoting curing of the product in presence of moisture of the atmosphere.

4,962,153

PRECURED SILICONE EMULSION

Donald T. Liles, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 270,600, Nov. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 130,767, Dec. 9, 1987, abandoned. This application Jan. 17, 1990, Ser. No. 466,542
Int. Cl.[5] C08L 83/00
U.S. Cl. 524—837 19 Claims

1. An aqueous silicone emulsion which dries to an elastomer comprising the product produced by

(A) homogenizing a mixture consisting essentially of

(1) 100 parts by weight of hydroxyl endblocked polydiorganosiloxane oligomer free of aliphatic unsaturation,

(2) from 0.1 to 10 parts by weight of organosilicon hydride crosslinker,

(3) anionic or nonionic surfactant, and

(4) sufficient water to give a polydiorganosiloxane content in the mixture of from 40 to 70 percent by weight, (B) emulsion polymerizing the mixture of (A) by addition of anionic polymerization catalyst suitable to copolymerize the ingredients (1) and (2) to obtain a hydroxyl endblocked copolymer having pendant hydrogen atoms on the siloxane chain, then

(C) arresting polymerization by raising the pH to a value of from about 6 to 11, then

(D) crosslinking the emulsion copolymer by addition of a silanol-silicon hydride condensation catalyst, to obtain an aqueous silicone emulsion which dries to an elastomer.

4,962,154

LATEX-ANTIGEN-ANTIBODY COMPLEXES FOR IMMUNOASSAY

Douglas K. Pollock; Charles J. McDonald; William E. Cohrs, all of Midland, Mich., and John M. Reno, Brier, Wash., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 14, 1988, Ser. No. 218,782

Int. Cl.[5] C08H *1/00;* **C08F** *12/06, 20/02, 20/04, 20/10, 22/00, 120/00, 122/00*

U.S. Cl. 525—54.1 **17 Claims**

1. A latex particle comprising a vinyl aromatic monomer selected from the group consisting of styrene, vinyl toluene, t-butyl styrene and mixtures thereof, a vinyl acrylate ester monomer having a pendent alkyl ester group of from 1 to 6 carbon atoms, wherein the vinyl aromatic monomer and vinyl acrylate ester monomer are employed in a weight ratio of about 1:3 to 3:1 vinyl acrylate ester to vinyl aromatic monomer, and a protein binding modifying monomer which is a vinyl carboxylic acid that is about 0.5 to about 10 weight percent of the vinyl aromatic and vinyl acrylate ester monomers.

4,962,155

METHODS AND COMPOSITIONS FOR ACTIVATING THE HUMAN INSULIN RECEPTOR KINASE

Yoko Fujita-Yamaguchi, Glendora, Calif.; Jay M. McDonald, and David B. Sacks, both of St. Louis, Mo., assignors to City of Hope, Duarte, Calif. and Washington University, St. Louis, Mo.

Filed Dec. 7, 1987, Ser. No. 129,307

Int. Cl.[5] A61K *37/02, 37/26;* **C08H** *1/00;* **C08L** *89/00*

U.S. Cl. 525—54.1 **11 Claims**

1. A method of activating human insulin receptor kinase, comprising:

reacting human insulin receptor with poly L-lysine, poly L-ornithine, or protamine sulfate.

4,962,156

WATER- AND OIL-REPELLENT COMPOSITION

Masayoshi Shinjo, Settsu; Sumiko Okamoto, Toyonaka; Yasuko Katakura, Yamatokooriyama, and Seiji Takubo, Settsu, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 130,475, Dec. 9, 1987, abandoned. This application Aug. 15, 1989, Ser. No. 393,816

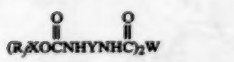
Claims priority, application Japan, Dec. 11, 1986, 61-295290

Int. Cl.[5] C08F *8/00*

U.S. Cl. 525—100 **7 Claims**

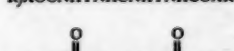
1. A water- and oil-repellent composition comprising (A) at least one species selected from the group consisting of a homopolymer and a copolymer of perfluoroalkyl group containing acrylate, a homopolymer and a copolymer of perfluoroalkyl group containing methacrylate, a copolymer of said acrylate or methacrylate and other monomer copolymerizable therewith provided that said monomer cannot be said acrylate or methacrylate, and a perfluoroalkyl group-containing urethane compound represented by the formulas (3) to (6):

(3)



(4)

(5)



(6)

wherein R_f is perfluoroalkyl group having 4 to 20 carbon atoms, X is $-CH_2CH(A)C_jH_{2j}-$, C_kH_{2k}- or $-SO_2N(R^7)C_iH_{2i}-$ wherein A is hydrogen, lower alkyl, hydroxyl or lower alkylcarbonyloxy, j is an integer to 0 to 4, k and i are an integer of 1 to 4 and R^7 is hydrogen or lower alkyl, Y is a bivalent organic group, Z is a monovalent organic group and W is a bivalent organic group, R^5 in the formula (6) is an organic group, R^6 is lower alkyl, n' is an integer of 3 to 10, and m' is an integer in the range of $n' \geqq m' \geqq 1$, and (B) a ladder polymer of silsesquioxane.

4,962,157

THERMOPLASTICS MOLDING MATERIALS BASED ON POLYPHENYLENE ETHERS AND POLYESTERS

Christof Taubitz, Wachenheim; Erhard Seiler, Ludwigshafen; Klaus Boehlke, Hessheim, and Dietrich Lausberg, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 20, 1988, Ser. No. 209,210

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1987, 3721338

Int. Cl.[5] C08L *71/12*

U.S. Cl. 525—132 **1 Claim**

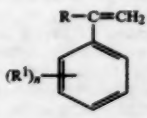
1. A thermoplastic molding material consisting essentially of

(A) not less than 5% by weight of a polymer component consisting of from 50 to 100% by weight of polyphenylene ethers and from 0 to 50% by weight of a styrene polymer differing from component (C),

(b) not less than 5% by weight of one or more polyesters, derived from the aromatic dicarboxylic acids selected from the group consisting of the naphthalene dicarboxylic acids, terephthalic acid and isophthalic acid, which aromatic acids are replaced in an amount of 0–10 mole % by adipic acid, azelic acid, sebacic acid, or the cyclohexane dicarboxylic acids,

(C) not less than 0.1% by weight of a copolymer consisting of

(C_1) not less than 20% by weight of α-olefins of 2 to 8 carbon atoms, styrene or substituted styrenes of the formula I



(I)

where R and R^1 independently of one another are each alkyl or 1 to 8 carbon atoms, hydrogen or halogen and n is 0, 1, 2 or 3, or a mixture of these monomers,

(C_2) is not less than 0.5% by weight of a polymerizable monomer containing epoxide groups,

(C_3) is from 0 to 65% by weight of one or more monomers from the group consisting of acrylonitrile, methacrylonitrile C_1–C_{20} esters of acrylic acid, C_1–C_{20} esters of methacrylic acid.

4,962,158

RADICAL POLYMERIZABLE COMPOSITION CONTAINING A COMPOUND HAVING PI-ELECTRON CONJUGATED STRUCTURE

Masao Kobayashi, and Reiko Otsuka, both of Tokyo, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1988, Ser. No. 160,431

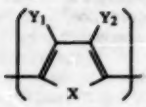
Claims priority, application Japan, Feb. 25, 1987, 62-41265; Feb. 12, 1988, 63-30583

Int. Cl.[5] C08L *65/00, 45/00*

U.S. Cl. 525—279 **13 Claims**

1. A radical polymerizable composition comprising:

(A) a compound having a pi-electron conjugated structure comprising a repeating unit represented by formula (I)



(I)

wherein X represents NH, S, O, Se or Te; Y_1 and Y_2, which may be the same or different, each represents a hydrogen atom, a substituted or unsubstituted alkyl group having from 1 to 12 carbon atoms, an alkoxy group, an alkoxycarbonyl group, an aryloxycarbonyl group, and alkoxysulfonyl group, an aryloxysulfonyl group or an amido group; and the parentheses indicate a repeating unit;

(B) a radical polymerizable compound; and

(C) a radical polymerization initiator.

4,962,159

REACTIVE POLYVINYL CHLORIDE AND POLYMER PRODUCTS MADE THEREFROM

Zaev Sharaby, South Euclid, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 276,175, Nov. 25, 1988. This application Sep. 1, 1989, Ser. No. 401,910

Int. Cl.[5] C08C *19/00*; C08F *8/00*

U.S. Cl. 525—386 **10 Claims**

1. A process for the production of a crosslinked copolymer containing an internally bound processing aid comprising the steps of:

(a) reacting a functionalized base polymer, said functionalized base polymer comprising the reaction product of a hydroxyl containing vinyl halide base polymer and a cyclic polyanhydride functionalizing agent, whereby the functionalizing agent covalently bonds to the base polymer through a reaction between a hydroxyl group(s) on the base polymer and a cyclic anhydride group(s) on the functionalizing agent, wherein the functionalizing agent after bonding to the base polymer has a free cyclic anhydride group(s) available for further reaction, and a processing aid coreactive therewith thereby obtaining a base polymer having the processing aid bonded thereon, and said bonded processing aid having at least one pendant functional group available for further reaction with a cyclic polyanhydride functionalizing agent;

(b) reacting with the product obtained in step (a) a cyclic polyanhydride functionalizing agent wherein said functionalizing agent after bonding retains free cyclic anhydride group(s) available for further reaction; and

(c) reacting the anhydride functionalized product of step (b) with a base polymer selected from the group consisting of hydroxyl containing vinyl halide polymers, base polymers having a coreactive processing aid bonded thereon and mixtures thereof, wherein each of steps (a)–(c) being conducted under anhydrous melt blending conditions.

4,962,160

SIDE CHAIN LIQUID CRYSTALLINE POLYMERS EXHIBITING NONLINEAR OPTICAL RESPONSE

Ronald N. DeMartino, Wayne; Hyun-Nam Yoon, New Providence; James B. Stamatoff, Westfield, and Alan Buckley, Berkeley Heights, all of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 822,090, Jan. 24, 1986, abandoned. This application Dec. 1, 1987, Ser. No. 127,174

The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.

Int. Cl.[5] C08F *283/06*; C09K *19/20*

U.S. Cl. 525—404 **11 Claims**

1. A thermotropic liquid crystalline polymer having a comb structure of mesogenic side chains which comprise at least about 25 weight percent of the polymer, wherein the polymer has a glass transition temperature above about 40° C., and the mesogens exhibit a second order nonlinear optical susceptibility β of at least about 5×10^{-30} esu as measured at 1.91 μm excitation wavelength.

4,962,161

THERMOSETTABLE RESIN COMPOSITIONS

Sung G. Chu, Wilmington; Harold Jabloner, New Castle, and Tuyen T. Nguyen, Wilmington, all of Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Aug. 17, 1987, Ser. No. 86,137

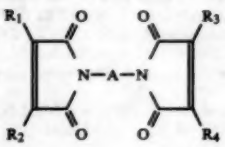
Int. Cl.[5] C08F *283/04*

U.S. Cl. 525—422 **3 Claims**

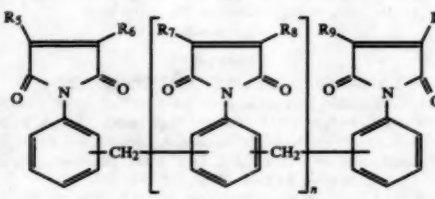
1. A prepeg comprising about 20 to about 50 weight percent of a thermosettable resin composition and about 50 to about 80 weight percent carbon fiber wherein said thermosettable resin comprises:

(a) at least one polyfunctional maleimide compound selected from the group consisting of (i) bismaleimide and (ii) polymaleimide, having the respective general formulas:

(i)

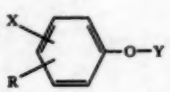


(ii)



where A is a divalent organic radical of at least two carbont atoms and R_1–R_{10} are the same or different hydrogen atoms, halogen atoms, cyano groups, straight-chain or branched, saturated or unsaturated alkyl radicals having from 1 to 6 carbon atoms, phenyl radicals or substituted phenyl radicals having one or more substitutents selected from straight-chain or branched, substituted or unsubstituted alkyl radicals, halogen atoms or, cyano groups, and where n is a positive integer; and,

(b) at least one ether derivative of alkenylphenol selected from the group consisting of compounds having the general formula:

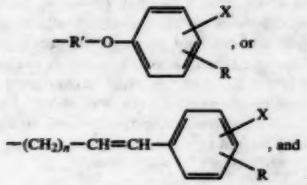


where X is

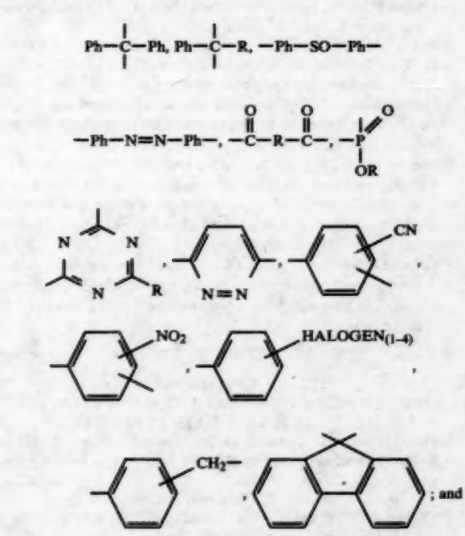
—CH=CH—R, or

—CH_2—CH=CH—R, and

where Y is



where R is defined a R_1–R_{10} in formulas (i) and (ii) above, and where R' is either a divalent organic radical of at least two carbon atoms selected from aliphatic, alicyclic, aromatic or heterocyclic radicals or a divalent organic radical of the general formula:



where R is defined as R_1–R_{10} in formulas (i) and (ii) above, and where n is a positive integer; and where the oxygen atom that connects Y and the aromatic ring can also be replaced by a sulfur atom.

4,962,162

RESIN COMPOSITION OF THERMOSETTING RESIN AND THERMOPLASTIC RESIN

Hiroyuki Kosuda; Yasuhisa Nagata, and Masato Andoh, all of Shizuoka, Japan, assignors to Toho Rayon Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1987, Ser. No. 102,968

Claims priority, application Japan, Sep. 30, 1986, 61-232964; Mar. 11, 1987, 62-54180; Mar. 11, 1987, 62-54181

Int. Cl.[5] C08L *61/02, 67/02, 69/00, 81/06*

U.S. Cl. 525—422 **12 Claims**

1. A resin composition containing a homogenous mixture of Components (A), (B) and (C) wherein said composition comprises (1) Component (C) as a reactive diluent and resin components consisting of Components (A) and (B), or (2) resin components consisting of Components (A), (B) and (C), wherein a thermosetting resin is Component (A), a thermoplastic resin is Component (B), and at least one compound selected from the group consisting of an epoxy resin capable of dissolving the thermoplastic resin and a reactive diluent possessing at least one epoxy group is Component (C) in a ratio such that the proportions of Components (A), (B) and (C) fall respectively in the ranges of 30 to 85% by weight, 10 to 30% by weight, and 5 to 49% by weight, based on the total weight of the resin composition, wherein the weight ratio of Component (B) to Component (C) is from about 0.2 to about 2; and wherein said thermosetting resin as Component (A) is an epoxy resin selected from the group consisting of a bisphenol A epoxy resin, a urethane modified bisphenol A epoxy resin, a novolak epoxy resin, a cresol novolak epoxy resin, and a glycidyl amine epoxy resin; and wherein said thermoplastic resin as Component (B) is a resin selected from the group consisting of a polycarbonate, a polyether ketone, a polysulfone, a polyether sulfone, a polyether imide and an aromatic polyester; and wherein said at least one of the epoxy resin and the reactive diluent as Component (C) comprises at least one compound selected from the group consisting of glycidyl aniline, phenyl glycidyl ether, glycidyl ester epoxy resin, hexanediol diglycidyl ether, and polypropylene glycol glycidyl ether.

4,962,163

VINYL ESTER RESINS CONTAINING MESOGENIC/RIGID RODLIKE MOIETIES

Robert E. Hefner, Jr.; Jimmy D. Earls, and Paul M. Puckett, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 17, 1989, Ser. No. 298,460

Int. Cl.[5] C08G *59/17*

U.S. Cl. 525—463 **92 Claims**

1. A thermosettable vinyl ester composition containing a mesogenic or rigid rodlike moiety which is prepared by reacting

(A) a polyepoxide composition comprising

(1) one or more advanced epoxy resins prepared by reacting

(a) one or more epoxy resins containing an average of more than one vicinal epoxide group per molecule wherein from about zero to 100 percent of such epoxy resins contain a mesogenic or rigid rodlike moiety; with

(b) at least one compound having an average of more than one phenolic hydroxyl group per molecule or an average of more than one carboxylic acid group per molecule, or a combination thereof; wherein at least one of components (a) or (b) contains a mesogenic or rigid rodlike moiety;

(2) optionally one or more compounds containing only one vicinal epoxide group per molecule wherein from zero to 100 percent of such monoepoxide compounds contain a mesogenic or rigid rodlike moiety; and, optionally,

(3) one or more epoxy resins containing an average of more than one vicinal epoxy group per molecule and which do not contain a mesogenic or rigid rodlike moiety; with

(B) one or more polymerizable monounsaturated monocarboxylic acids; and

wherein from about 1 to about 100 percent of the molecules of components (a) and (b) contain a mesogenic or rigid rodlike moiety; components (A) and (B) are present in quantities which provide a ratio of carboxylic acid groups per epoxide group of from about 0.9:1 to about 1.1:1; components (a) and (b) are present in amounts which provide a ratio of phenolic hydroxyl groups of carboxylic acid groups or combination of such groups per epoxy group of from about 0.01:1 to about 0.90:1; component (2) is present in an amount of from about zero to about 95 percent by weight based upon the combined weight of components (1), (2) and (3); and component (3) is present in an amount of from about zero to about 90 percent by weight based upon the combined weight of components (1), (2) and (3); but with the proviso that said advanced epoxy resin of

component (A1) is, when the amount of component (A2) is zero:

(i) other than the advanced epoxy resin prepared by reacting 4,4'-dihydroxybiphenyl with the diglycidyl ether of 4,4'-dihydroxybiphenyl; and

(ii) other than the advanced epoxy resin prepared by reacting any 4,4'-dihydroxychalcone compound with the diglycidyl ether of any 4,4'-dihydroxychalcone compound wherein the alkenyl group(s) of the chalcone moiety contain(s) only hydrogen or monoalkyl or monoaryl substituents.

4,962,164

DEGRADABLE POLYMERS AND ARTICLES MADE THEREFROM

Saleh A. Jabarin, Holland, Ohio, and Dennis C. Balduff, Florence, S.C., assignors to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Filed Jun. 27, 1988, Ser. No. 211,639
Int. Cl.[5] C08F *20/00*
U.S. Cl. 525—445 8 Claims

1. A degradable composition consisting essentially of

(A) a copolymer of ethylene and carbon monoxide used in an amount sufficient to provide about 0.001% to 0.05% wt. % of CO in the composition to reduce the percent elongation in six months to about 100% or lower, and

(B) a polyester comprising substantially the balance of the composition.

4,962,165

PROCESS FOR MAKING SILICONE PARTICLES

Newman M. Bortnick, Oreland, and Long-Jin Lin, Holland, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 12, 1989, Ser. No. 296,256
Int. Cl.[5] C08F *283/00*
U.S. Cl. 525—479 20 Claims

1. A process for preparing spherical crosslinked silicone-containing polymer particles comprising:

(a) forming an organosiloxane by hydrosilylation an organohydrosiloxane, containing at least two reactive silicon-hydrogen bonds per molecule, with a multifunctional unsaturated monomer in the presence of an effective amount of a hydrosilylation catalyst at a temperature of from about 25 C. to about 60 C., said multifunctional unsaturated monomer being unsaturated and reactive with said silicon-hydrogen bonds on said organohydrosiloxane while maintaining the ability after said reaction to be subsequently copolymerized in water and

(b) polymerizing the organosiloxane with itself or with at least one other unsaturated monomer at a temperature from about 65 C. to about 95 C. to form said spherical crosslinked silicon-containing polymer particles.

4,962,166

MANUFACTURE OF CREEP-FREE PREPREGS BASED ON PHENOLIC RESINS

Francois Boinot, Lievin, and Michel Cousin, Loison-Sous-Lens, both of France, assignors to Norsolor, Paris la Defense, France

Continuation of Ser. No. 917,458, Oct. 10, 1986, abandoned. This application Aug. 18, 1988, Ser. No. 233,935
Claims priority, application France, Oct. 10, 1985, 85 15007
The portion of the term of this patent subsequent to Mar. 27, 2007, has been disclaimed.
Int. Cl.[5] C08L *61/14*
U.S. Cl. 525—506 8 Claims

1. In a process for the manufacture of creep-free prepregs based on phenolic resins of the resole type, comprising impregnating fibrous reinforcing agents with a phenolic resole resin, the improvement comprising employing an essentially solvent-free phenolic resole resin containing about 85% solids and controlling the viscosity of the resin comprising adding a viscosity controlling amount of up to 60% by weight of the resin of an additive, said additive consisting essentially of a lithium metaborate or an alkaline-earth metaborate or a mixture thereof, the resultant impregnating composition being initially fluid and having a viscosity which does not change more than about 50 times the initial value during the first 24 hours and which changes by a factor of about 2 in the next 24 hour period, the resultant creep-free prepreg containing about 30 to 80% by weight of a reinforcing mat by weight of resole resin in the "B" stage.

4,962,167

PROCESS FOR PREPARING ULTRA-HIGH MOLECULAR WEIGHT POLYETHYLENE

Takeichi Shiraishi, Kawasaki; Wataru Uchida, Yokohama, and Kazuo Matsuura, Higashi-Yukigaya, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed Nov. 14, 1988, Ser. No. 271,108
Claims priority, application Japan, Nov. 13, 1987, 62-285489
Int. Cl.[5] C08F *4/654, 10/02*
U.S. Cl. 526—125 9 Claims

1. A process for preparing an ultra-high molecular weight polyethylene having an intrinsic viscosity of 6 to 50 dl/g by the polymerization of ethylene using a catalyst comprising a solid catalyst component and an organometallic compound, characterized in that said solid catalyst component is a product obtained by contacting the following (A) and (B) together:

(A) the reaction product of a magnesium dihalide and a titanium compound represented by the general formula $Ti(OR)_4$ wherein R is a hydrocarbon group having 1 to 20 carbon atoms;

(B) the reaction product of an aluminum trihalide and a silicon compound represented by the general formula $Si(OR')_4$ wherein R' is a hydrocarbon group having 1 to 20 carbon atoms.

4,962,168

METHOD FOR PREPARING A FLAME-RETARDANT TRIALLYL ISOCYANURATE PREPOLYMER

Satoshi Hiratsuna, Hiroshi Hotta; Tomomi Hayashi, all of Kyoto, Japan, assignors to 501 Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Jan. 2, 1990, Ser. No. 460,263
Claims priority, application Japan, Jan. 10, 1989, 1-32790
Int. Cl.[5] C08F *130/02*
U.S. Cl. 526—193 5 Claims

1. A method for preparing a flame-retardant triallyl isocyanurate prepolymer, characterized in that the polymerization of triallyl isocyanurate is carried out in the presence of a polymerization modifier and a polymerization initiator, said polymerization modifier being 6H-dibenz [c,e] [1,2] oxaphosphorine-6-oxide and being used in an amount of 1 to 200% by weight on the basis of the weight of triallyl isocyanurate.

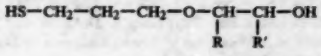
4,962,169

OXA-ORGANIC SULFUR COMPOUNDS, THEIR PREPARATION AND USE

John S. Roberts, and Tod K. Shioyama, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 234,315, Aug. 19, 1988, Pat. No. 4,891,444.
This application Oct. 16, 1989, Ser. No. 422,044
Int. Cl.[5] C08F *2/00, 2/38*
U.S. Cl. 526—209 6 Claims

1. A method of controlling average polymer chain length during the synthesis of a polymer from monomer reactants comprising combining with said monomer reactants a chain growth terminating oxa-organic sulfur compound having the structural formula



wherein R is an alkyl or aryl group containing a halide, nitro, sulfide or ether substituent and R′ is hydrogen or an alkyl or aryl group containing a halide, nitro, sulfide or ether substituent.

4,962,170

METHOD OF MAKING HIGHLY ABSORPTIVE POLYMERS

Richard C. Chromecek, Litchfield County, Conn.; Milan F. Sojka, Orange County, N.Y., and Lon L. Weiss, Fresno County, Calif., assignors to Dow Corning Corporation, Midland, Mich.

Filed Aug. 31, 1989, Ser. No. 401,582
Int. Cl.[5] C08F *2/06*
U.S. Cl. 526—212 **8 Claims**

1. A method of forming an adsorptive polymer by precipitation polymerization, comprising the steps of:

(a) homogeneously mixing a solution of from about 0.1 to less than 25 parts by weight of a monomer consisting exclusively of one or more types of polyunsaturated monomers, from greater than 75 to about 99.9 parts by weight of a monomer solvent, wherein the total parts of said monomers and said monomer solvent is 100 parts, and between about 0.05 to 5 weight percent free radical initiator based on the weight of said monomer,

(b) polymerizing said monomers by precipitation polymerization to form a polymer which is a combined system of particles, said particles ranging in size from 0.1 to 0.5 microns in diameter, and wherein said monomer solvent is a solvent for said monomers and a non-swelling non-solvent for said polymer, and

(c) removing said solvent from said polymer to form a dry powder.

4,962,171

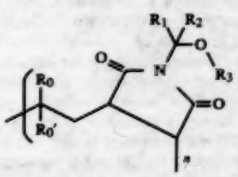
BLOCKED MONOMER AND POLYMERS THEREFROM FOR USE AS PHOTORESISTS

Christopher E. Osuch, Mine Hill, and Michael J. McFarland, Bound Brook, both of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 52,950, May 22, 1987, Pat. No. 4,810,613. This application Dec. 22, 1988, Ser. No. 289,592
Int. Cl.[5] C08F *32/04*
U.S. Cl. 526—266 **13 Claims**

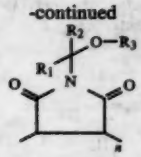
1. A composition comprising: a polymer containing imide groups blocked by a methylol group or substituted methylol group and further blocked to form an acetal or ketal moiety said polymer having a molecular weight in the range of from about 10,000 to about 200,000.

5. A composition comprising: a polymer with the structure



or

-continued



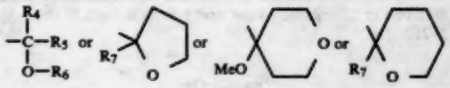
where:

R_0 is H or methyl

R_0' is aryl, o-alkyl, or 0-aryl

R_1 and R_2 are H or C_1 to C_4 alkyl

R_3 is



where:

R_4, R_5 are H or C_1 to C_4 alkyl

R_6 is C_1 to C_{10} alkyl

R_7 is C_1 to C_4 alkyl or H.

9. The composition of claim 8 wherein R_0' is —0—(n-decyl).

4,962,172

ABSORBENT PRODUCTS AND THEIR MANUFACTURE

Adrian S. Allen, North Yorkshire; David Farrar, and Peter Flesher, both of West Yorkshire, all of England, assignors to Allied Colloids Ltd., Great Britain

Filed Nov. 20, 1987, Ser. No. 123,572
Claims priority, application United Kingdom, Nov. 20, 1986, 8627729; Apr. 10, 1987, 8708601; Apr. 10, 1987, 8708690; Apr. 10, 1987, 8708599; Aug. 4, 1987, 8718396
Int. Cl.[5] C08F *220/10*
U.S. Cl. 526—318.42 **22 Claims**

1. A water absorbent, water insoluble, polymeric element that has a gel capacity of at least 50 grams deionized water per gram dry polymer and that has been made by a process comprising the steps of (a) providing a substantially linear polymer that has been made by polymerization of a water soluble ethylenically unsaturated monomer blend comprising at least 50% by weight monomer that provides carboxylic acid groups and 0.1 to 15% by weight monomer that provides hydroxyl groups that can react with the carboxylic acid groups to form ester cross linkages that contain only carbon and oxygen atoms in the linkages, (b) shaping a solution of the polymer by a shaping step selected from extrusion, coating, impregnation and foaming to shape the linear polymer into the shape of the desired element and then (c) heating the shaped element to cause the said carboxylic and hydroxylic groups to react in the shaped element to form the said cross linkages.

4,962,173

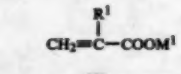
CEMENT DISPERSION AGENTS COMPRISING WATER SOLUBLE VINYL COPOLYMER

Mitsuo Kinoshita; Toshihide Shimono; Shozo Yamaguchi, and Tsuneo Yamamoto, all of Aichi, Japan, assignors to Takemoto Yushi Kabushiki Kaisha, Aichi, Japan

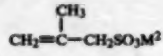
Filed Jan. 17, 1989, Ser. No. 296,974
Claims priority, application Japan, Mar. 4, 1988, 63-52344
Int. Cl.[5] C08F *228/02*
U.S. Cl. 526—240 **5 Claims**

1. A cement dispersion agent comprising a water-soluble vinyl copolymer having numerical average molecular weight of 2000–15000 which is obtainable by copolymerization of at least first monomer shown by Formula A given below, second monomer shown by Formula B given below and third mono-

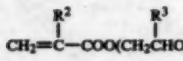
mer shown by Formula C at copolymerization ratio of 10-50-/3-25/80-40 by weight:



(A)



(B)



(C)

where R^1, R^2 and R^3 are H or CH_3, R^4 is alkyl group with 1-3 carbon atoms, M^1 and M^2 are alkali metal, alkali earth metal, ammonium or organic amine, and n is an integer in the range 5-25.

4,962,174

PREPARATION OF ALKOXYSILETHYLENE ENDBLOCKED POLYDIORGANOSILOXANE

Carl J. Bilgrien, Midland, Mich., and Daniel T. Berg, LaCrosse, Wis., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 18, 1990, Ser. No. 466,844
Int. Cl.[5] C08G 77/06
U.S. Cl. 528—15 5 Claims

1. A method of producing an alkoxysilethylene endblocked polydiorganosiloxane consisting essentially of

(A) mixing hydroxyl endblocked polydiorganosiloxane with sufficient SiH compound having from 2 to 4 inclusive SiH groups to react with the hydroxyl groups of the polydiorganosiloxane without an appreciable increase in molecular weight of the starting polymer and a platinum catalyst, then heating to a temperature of from 25 to 150° C. for a time sufficient to react all of the hydroxyl groups of the polydiorganosiloxane, then

(B) stripping the excess SiH compound from the mixture by applying a vacuum of less than 25 mm of mercury and heating to a temperature of from 25 to 150° C., to leave a SiH endblocked polymer, then

(C) adding sufficient vinyltrialkoxysilane to react with the SiH groups on the polymer of step (B), heating to a temperature of from 25 to 150° C. for a period of time sufficient to react all of the SiH groups present, then

(D) stripping the excess vinyltrialkoxysilane from the mixture by applying a vacuum of less than 25 mm of mercury and heating to a temperature of from 25 to 150° C., to leave a trialkoxysilethylene endblocked polydiorganosiloxane.

4,962,175

ALKYLPOLY (POLYSILYL) AZANE PRECERAMIC POLYMERS

Duane R. Bujalski, Bay City; Gary E. LeGrow, and Thomas F. Lim, both of Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 22, 1986, Ser. No. 945,125
Int. Cl.[5] C08G 77/06
U.S. Cl. 528—19 55 Claims

1. An alkylpoly(polysilyl)azane of the average formula

$$(R_2Si)(RSi) \quad (I)$$

containing from 0 to 60 mole percent (R_2Si) units and 40 to 100 mole percent (RSi) units, where each R is independently selected from alkyl radicals containing 1 to 4 carbon atoms and where there is also bonded to the silicon atoms other silicon atoms and radicals having the formula —$NHSiR_3$" wherein each R" is independently selected from hydrogen, alkyl radicals having 1 to 4 carbon atoms, a vinyl radical, or a phenyl radical.

4,962,176

POLYSILANE PRECERAMIC POLYMERS

Duane R. Bujalski, Bay City; Gary E. DeGrow, and Thomas F. Lim, both of Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 22, 1986, Ser. No. 945,126
Int. Cl.[5] C08G 77/06
U.S. Cl. 528—19 31 Claims

1. A polysilane, which is solid at 25° C. having the average unit formula $(R_2Si)(RSi)(R'Si)$ wherein each R is independently selected from alkyl radicals containing 1 to 4 carbon atoms, wherein each R' is independently selected from the group consisting of alkyl radicals of at least six carbon atoms, phenyl radicals, and radicals of the formula $A_yX_{(3-y)}Si(CH_2)_z$—where A is a hydrogen atom or an alkyl radical containing 1 to 4 carbon atoms, y is an integer equal to 0 to 3, X is chlorine or bromine, and z is an integer greater than or equal to 1, and where there are from 0 to 40 mole percent (R_2Si) units, 1 to 99 mole percent (RSi). and 1 to 99 mole percent (R'Si) units and wherein the remaining bonds on silicon are attached to either other silicon atoms, chlorine atoms, or bromine atoms.

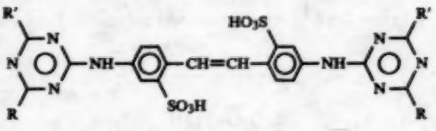
4,962,177

AMINOFUNCTIONAL ORGANOSILICON OPTICAL BRIGHTENERS

Peter Y. K Lo, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 176,967, Apr. 4, 1988, Pat. No. 4,866,152.
This application May 5, 1989, Ser. No. 347,705
Int. Cl.[5] C08G 77/04
U.S. Cl. 528—26 8 Claims

1. A fluorescent elastomeric film comprising the reaction product of a polyfunctional acrylate and a fluorescent compound derived from the reaction of at least one aminofunctional organosilicon compound and at least one optical brightener having the formula



and wherein R denotes anilino, sulfanilic acid, metanilic acid, or anilin-2,5-disulfonic acid, and R' is methoxy, methylamino, N-methyl-N-hydroxyethylamino, bis(hydroxyethyl)amino, morpholino, anilino, or diethylamino.

4,962,178

POLYSILOXANE-POLYURETHANES AND CONTACT LENS THEREOF

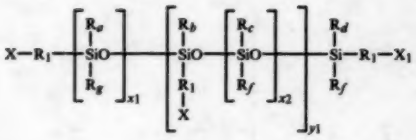
Paul Harisiades, Woodhaven, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 3, 1988, Ser. No. 266,555
Int. Cl.[5] C08G 77/20, 77/388
U.S. Cl. 528—33 10 Claims

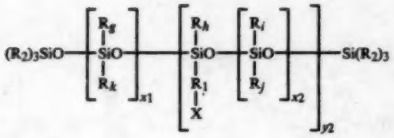
1. A siloxane-urethane polymer, suitable for use as an oxygen permeable membrane or an ophthalmic device, having based on total urethane groups 50 to 80% of —C—NH—COO—C— groups and 50 and 20% of —C—NH—COO—Si— groups, which consists essentially of the polymerization product of

(a) 80-95% weight (based on the total polymer) of a polyisocyanate capped, linear or branched polysiloxane prepolymer, having a molecular weight of about 1000 to about 10,000 and containing at least one isocyanate group per 3000 molecular weight unit of polysiloxane, said isocyanate groups being attached to the polysiloxane through urethane linkages, said polysiloxane prepolymer having the structure A_1, A_2 and A_3

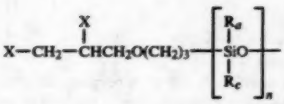
(A1)

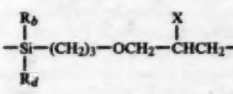


(A2)



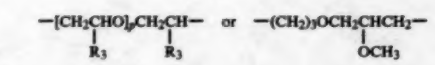
(A3)





wherein:

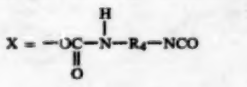
R_1 is a linear or branched alkylene group with 2–6 carbon atoms or a polyoxyalkylene group of structures

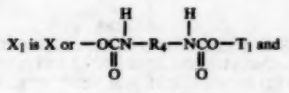


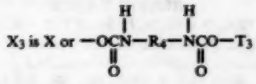
wherein R_3 is hydrogen or methyl and p is an integer from 1–50; R_2, R_a, R_b, R_c, R_d, R_e, R_f, R_g, R_h, R_i, R_j, R_k are independently methyl or phenyl; x_1, x_2 are integers from 1 to 500 with the proviso that the sum of x_1+x_2 is 12 to 1,000; y_1 is 0 to 4 and y_2 is 2 to 5 with the proviso that the respective ratios of

$$\frac{x_1 + x_2 y_1}{y_1 + 2} \text{ (for } A_1\text{)} \quad \text{and} \quad \frac{x_1 + x_2 y_2}{y_2} \text{ (for } A_2\text{)}$$

are not greater than 70,







wherein

T_1 is A_1 from which X_1 removed, and

T_3 is A_3 from which X_3 is removed,

R_4 is a di-radical obtained by removing NCO-groups from an aliphatic, cycloaliphatic or aromatic di-isocyanate; and

(b) 20–50% by weight (based on the total polymer) of a linear polydialkyl- or polydiphenyl-siloxane disilanol in

(B)

having a molecular weight from about 240 to about 1000 and containing terminal siloxanol groups,

where, n is 2–50 and E_a and E_b are alkyl of 1 to 4 carbon atoms or phenyl.

4,962,179

EPOXIDIZED FATTY ACID ESTER COMPOSITIONS

Larry S. Corley, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 31, 1989, Ser. No. 401,277

Int. Cl.[5] C08G *59/32, 59/38*

U.S. Cl. 528—90 **29 Claims**

1. A composition comprising:

(a) an epoxidized fatty acid ester;

(b) a curing amount of an aromatic amine; and

(c) a catalytic amount of an acidic or metal salt curing accelerator.

4,962,180

PROCESS FOR THE PRODUCTION OF AROMATIC POLYESTERS

Peter Fialla, Maria Enzersdorf, Austria, assignor to Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft, Wiener Neudorf, Austria

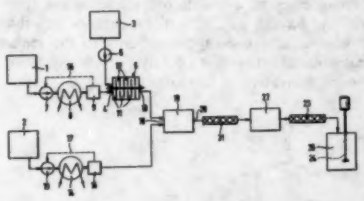
PCT No. PCT/AT87/00062, § 371 Date Jun. 16, 1988, § 102(e) Date Jun. 16, 1988, PCT Pub. No. WO88/03152, PCT Pub. Date May 5, 1988

PCT Filed Oct. 21, 1987, Ser. No. 224,917

Claims priority, application Austria, Oct. 21, 1986, 2796/86

Int. Cl.[5] C08G *63/18, 63/02*

U.S. Cl. 528—176 **8 Claims**



1. A continuous process for producing an aromatic polyester by polycondensing at least one mono- or multinuclear substituted diphenol as first reactant with at least one aromatic dicarboxylic acid halide as second reactant comprising:

preparing an aqueous phase by mixing the said at least one diphenol, an alkali metal hydroxide for the formation of diphenolates with or without a phase transfer catalyst, water or a mixture of water and an organic solubilizer;

preparing an organic liquid phase by mixing the said at least one aromatic dicarboxylic acid halide and an organic solvent to form a solution thereof;

continuously mixing the aqueous phase with an organic solvent to form a fine pre-emulsion;

preparing a reaction emulsion by continuously supplying organic liquid phase and pre-emulsion to an input of a dispersing unit whereby reactants in said phase and pre-emulsion are mixed in constant proportions;

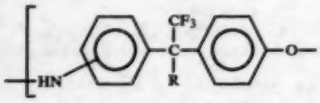
passing and reacting the reaction emulsion through at least one dispersing unit.

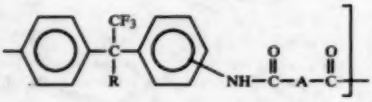
4,962,181
POLYAMIDE POLYMER HAVING 12-F FLUORINE-CONTAINING LINKING GROUPS

Rohitkumar H. Vora, Westfield, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.

Filed May 8, 1989, Ser. No. 348,635
Int. Cl.[5] C08G *69/26*
U.S. Cl. 528—183 **15 Claims**

1. A polyamide polymer or copolymer containing at least one structural unit of the formula:





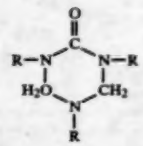
wherein R is selected from the group consisting of CF_3 and phenyl and A is a divalent organic, radical selected from alkylene, phenylene, naphthalene, or a bis or polyphenylene, said polyamide having a weight average molecular weight of at least about 5,000.

4,962,182
PROCESS FOR CURING AMINOPLASTIC RESINS

Roger Garrigue, and Jack Lalo, both of Toulouse, France, assignors to Norsolor (Orkem Group), Paris La Defense, France

Filed Dec. 23, 1988, Ser. No. 289,272
Claims priority, application France, Dec. 23, 1987, 87 18003
Int. Cl.[5] C08G *12/12*
U.S. Cl. 528—230 **12 Claims**

1. In a process for curing liquid urea-formaldehyde resins containing essential amounts of melamine less than 10% by weight and having a F/NH_2 molar ratio of less than 0.5, the improvement which comprises adding to the melamine-containing aminoplastic resins a catalyst consisting essentially of a triazinone derivative of formula:



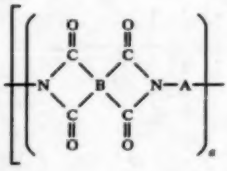
in which R is H and/or CH_2OH, this catalyst being employed in a proportion of 0.01 to 0.2 moles per 100 grams of dry resin.

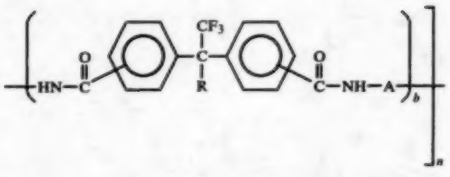
4,962,183
POLYIMIDE-POLYAMIDE POLYMER HAVING FLUORINE-CONTAINING LINKING GROUPS

Paul N. Chen, Sr., Gillette, and Rohitkumar H. Vora, Union County, both of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed May 8, 1989, Ser. No. 348,634
Int. Cl.[5] C08G *73/14*
U.S. Cl. 528—342 **18 Claims**

1. A polyimide-polyamide polymer containing at least one recurring structural unit of the formula:





wherein n is a number corresponding to a polymer inherent viscosity of at least about 0.1 as measured from a solution of the polymer in dimethylacetamide at 25° C. at a polymer concentration of 0.5 weight percent, A is a divalent aromatic moiety, B is a tetravalent aromatic organic radical wherein each pair of carbonyl groups are attached to adjacent carbon atoms in the ring moiety B, R is CF_3 or phenyl, and the terms a and b are equal to the mole fraction of each recurring unit in the polymer chain and a ranges from about 0.05 to about 0.95, b ranges from about 0.95 to about 0.05, with the proviso that the sum of a and b is equal to 1.00.

4,962,184
POLYKETONE POLYMER USEFUL IN CHROMATOGRAPHY

Edgar J. Smutny, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 31, 1988, Ser. No. 175,821
Int. Cl.[5] C08G *67/02*
U.S. Cl. 528—392 **5 Claims**

1. A material suitable for use as a stationary phase in chromatographic processes for adsorbing metal ions selected from the group consisting of chromium, manganese, silver, gold, sodium and calcium, comprising:

a polymerized linear alternating polymer prepared from carbon monoxide and at least one ethlenically unsaturated hydrocarbon.

4,962,185
PROCESS OF RENDERING COPOLYMER POWDERS OF MALEIC ANHYDRIDE AND AN ALKYL VINYL ETHER PREPARED IN BENZENE SOLVENT SUBSTANTIALLY BENZENE-FREE

Mohammed Tazi, Wayne, N.J.; Yoon T. Kwak, Brooklyn, N.Y., and Krystyna Plochocka, Scotch Plains, N.J., assignors to GAF Chemicals Corporation, Wayne, N.J.

Filed Oct. 2, 1989, Ser. No. 415,834
Int. Cl.[5] C08F *6/00*
U.S. Cl. 528—497 **9 Claims**

1. A process of rendering copolymer powders of maleic anhydride and a C_1–C_5 alkyl vinyl ether containing residual benzene solvent therein substantially benzene-free, which comprises treating the copolymer powders with toluene at a temperature of about 115° C. to about 125° C.

4,962,186

METHOD OF IMPROVING THE COLOR OF TALL OIL ROSIN ESTERS BY RECRYSTALLIZING AND DISTILLING ROSIN FOLLOWED BY ESTERIFYING

Robert W. Johnson, Jr., Savannah, Ga., assignor to Union Camp Corporation, Wayne, N.J.

Filed Jul. 10, 1989, Ser. No. 377,869
Int. Cl.[5] C09F 1/04
U.S. Cl. 530—218 8 Claims

1. A method of improving the color of tall oil rosin esters which comprises the sequential steps of:

(a) recrystallizing the tall oil rosin from solvent,

(b) distilling the recrystallized rosin, and

(c) esterifying the distilled rosin with a polyol.

4,962,187

COMMON ANTIGEN FOR COLORECTAL AND MUCINOUS OVARIAN TUMORS AND PROCESS FOR ISOLATING THE SAME

Keshab D. Pant, Albuquerque, N. Mex., assignor to Cota Biotech, Albuquerque, N. Mex.

Continuation of Ser. No. 674,494, Nov. 28, 1984. This application Nov. 21, 1986, Ser. No. 933,304
Int. Cl.[5] C07K 15/00; A61K 39/00
U.S. Cl. 530—350 10 Claims

1. A tumor identifying antigen (COTA) isolatable from and having specific binding affinity with human colorectal tumors and human ovarian tumors comprising at least one member selected from the group consisting of proteins and glycoproteins having a molecular weight of between 3 and 15 million daltons, said antigen being immunologically distinct from Carcinoembryonic antigen (CEA), Colon specific antigen p (CSA_P), and Carbohydrate antigen 19-9 (Ca 19-9).

The term CEA is conventionally recognized as representing "Carcinoembryonic antigen" which was originally described as being present in intodermal derived tumors of the gastrointestinal tract [Gold et al., J. Exp. Med. 121:439–462 (1965]. The term CSAP is conventionally

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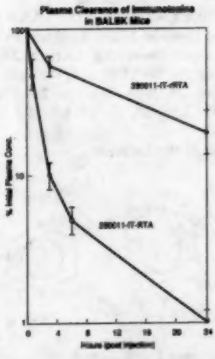
4,962,188

RECOMBINANT RICIN TOXIN A CHAIN CONJUGATES

Arthur E. Frankel, Chapel, N.C., assignor to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 806,256, Dec. 6, 1985, abandoned. This application Sep. 30, 1986, Ser. No. 913,357
The portion of the term of this patent subsequent to Sep. 11, 2007, has been disclaimed.
Int. Cl.[5] C07K 15/12; A61K 39/00
U.S. Cl. 530—389 2 Claims



1. A conjugate comprising unglycosylated recombinant ricin toxin A chain and a murine monoclonal antibody, said conjugate being maintained in an effective cytotoxic amount in the circulation of a host animal for substantially longer times than similar conjugates made of native ricin A chain, wherein said monoclonal antibodies are selected from the gorup consisting of 2G3, 9C6, 33F8, 44B2, 44F4, 120H7, 200F9, 204F4, 219F3, -245E7, 260F9, 266B2, 280D11, 317G5, 369F10, 388D4, 421E8, 451C3, 454A12, 454C11, 650E2, -788G6, and 871E3.

4,962,189

RIBOTOXIN CONJUGATES

Will Blee, El Cerrito, Calif., assignor to Cetus Corporation, Emeryville, Calif.

Division of Ser. No. 747,114, Jun. 20, 1985, abandoned. This application Dec. 11, 1987, Ser. No. 131,646
Int. Cl.[5] A61K 37/02, 39/00; C07K 15/28
U.S. Cl. 530—391 4 Claims

1. Ricin E2 conjugated to a binding moiety.

4,962,190

AZO DYES CONTAINING POLYETHYLENEIMINE WITH AN ANILINE DIAZO COMPONENT AND A HYDROXYNAPHTHALENE, AMINOPYRIDINE OR ACETOACETIC COUPLING COMPONENT

Udo Mayer, Frankenthal, and Friedrich-Wilhelm Raulfs, Mannheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 21, 1988, Ser. No. 273,917
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1987, 3739456
Int. Cl.[5] C09B 69/10; C09D 11/02; D06P 1/52
U.S. Cl. 534—573 3 Claims

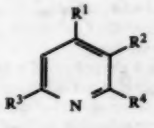
1. A polyethyleneimine-containing azo dye of the formula I:

$$[(D-N=N-K-)_yX-]_mP \quad (I)$$

where

D is the radical of a diazo component which is aniline which is unsubstituted or substituted with C_1–C_4-alkyl, halogen, hydroxyl, C_1–C_4-alkoxy, C_1–C_4-alkanoyl, amino, nitro, formyl, C_1–C_4-alkoxycarbonyl, carbamoyl, C_1–C_4-monoalkyl- or dialkyl-carbamoyl, cyano, benzothiazol-2-yl or C_1–C_4-alkyl-benzothiazol-2-yl, and which is free of hydroxysulfonyl groups,

K is the radical of a coupling component which is (1) hydroxynaphthalene which is unsubstituted or substituted with hydroxysulfonyl, carboxyl, C_1–C_4-alkoxycarbonyl, amino or C_1–C_4-monoalkylamino, or (2) aminopyridine of the formula



where

R^1 is C_1–C_4-alkyl,

R^2 is hydrogen, cyano or carbamoyl,

R^3 is hydrogen, hydroxyl, C_1–C_6-alkoxy, which may be interrupted by one or two oxygen atoms, substituted or unsubstituted phenoxy, amino, C_1–C_6-monoalkyl- or dialkyl-amino, where the alkyl chain may in each case be interrupted by one or two oxygen atoms, or substituted or unsubstituted phenylamino, and

R^4 is chlorine or the radical R^3, R^3 being as defined above, which, if substituted by hydroxysulfonyl, has at most one hydroxysulfonyl group, or (3) methyl- or ethyl-acetoacetate,

y is 1 or 2,

X is a covalent bond or a bridge member if y is 1 or a bridge member if y is 2, and

P is the radical of a polyethyleneimine whose degree of polymerization n is from 5 to 25,000, and the number m of chromophore radicals is dependent upon the degree of polymerization n and is defined by the ratio m:n = from 1:1 to 1:35, with the proviso that when K is substituted by hydroxysulfonyl, the ratio m:n is from 1:2 to 1:35.

4,962,191

1:2 CHROMIUM OR COBALT COMPLEX AXO DYES CONTAINING AT LEAST ONE 2-ARYL-4-AMINO-6-HYDROXYPYRIMIDINE RADICAL

Alois Püntener, Rheinfelden, and Kurt Burdeska, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

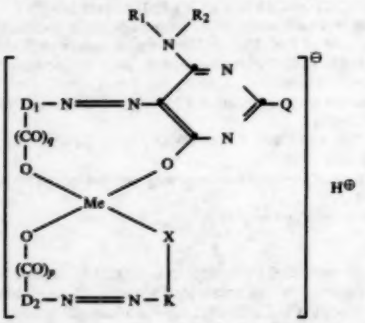
Filed Aug. 28, 1989, Ser. No. 399,202

Claims priority, application Switzerland, Aug. 31, 1988, 3238/88

Int. Cl.[5] C09B 45/48, 45/00; D06P 1/39, 3/32

U.S. Cl. 534—698 **15 Claims**

1. A metal complex compound which, in the form of the free acid, has the formula

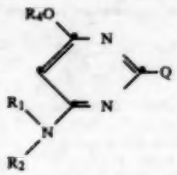


(1)

wherein

D_1 and D_2 are each independently of the other a phenyl or 1- or 2-naphthyl radical, which carries a hydroxy or carboxy group in ortho-position to the azo group and which is unsubstituted or substituted by C_1–C_4alkyl, C_1–C_4alkoxy, halogen, trifluoromethyl, C_1–C_4alkylsulfonyl, sulfamoyl, N-mono- or N,N-dialkylsulfamoyl, the alkyl moiety or moieties containing 1 to 4 carbon atoms, carbamoyl, N-mono- or N,N-dialkylcarbamoyl, the alkyl moiety or moieties or moieties containing 1 to 4 carbon atoms, sulfo, nitro, cyano, carboxy, phenoxy, C_1–C_4alkanoylamino, benzoylamino or C_1–C_4alkoxycarbonyl,

K is the radical of an unsubstituted phenol or of a phenol which is substituted by C_1–C_5alkyl, C_1–C_4alkoxy, N,N-dialkylamino containing 1 to 4 carbon atoms in each of the alkyl moieties, C_1–C_4alkoxycarbonylamino or C_1–C_4alkanoylamino; of an unsubstituted 1- or 2-naphthyl or of a 1- or 2-naphthol which is substituted by C_1–C_4alkyl, C_1–C_4alkoxy, chloro, amino, C_1–C_4alkanoylamino, benzoylamino or sulfo; of a 5-pyrazolone which carries in 1-position an unsubstituted phenyl or naphthyl radical or a phenyl or naphthyl radical which is substituted by chloro, nitro, sulfo, C_1–C_4alkyl or C_1–C_4alkoxy; of a 6-hydroxy-3-cyano-or 6-hydroxy-3-carbamoyl-2-pyridone which in 1-position is substituted by C_1–C_4alkyl, β-hydroxyethyl, β-aminoethyl, γ-isopropoxypropyl or phenyl and in 4-position is unsubstituted or substituted by C_1–C_4alkyl; of an acetoacetanilide or benzoylacetanilide, each of which is unsubstituted or is substituted in the anilide nucleus by chloro, nitro, C_1–C_4alkyl, C_1–C_4alkoxy or sulfo; of a 1- or 2-naphthylamine which is unsubstituted or substituted by sulfo, sulfamoyl, or N-mono- or N,N-dialkylsulfamoyl which contains 1 to 4 carbon atoms in the alkyl moiety or moieties; or is the radical of a compound of formula



(2)

and wherein K carries the group X in ortho-position to the azo group,

Me is chromium or cobalt,

Q is phenyl or phenyl which is substituted by C_1–C_4alkyl, C_1–C_4alkoxy, halogen, nitro, cyano, C_1–C_4alkoxycarbonyl, C_1–C_4alkylsulfonyl, sulfo or trihalomethyl, or is 1- or 2-naphthyl or unsubstituted or C_1–C_4alkyl-, nitro-, cyano-, C_1–C_4alkoxycarbonyl- or C_1–C_4alkyl...do-substituted furanyl, thienyl, thiazolyl, oxazolyl, isothiazolyl, benzthiazolyl, benzisothiazolyl, pyrazolyl, imidazolyl, 1,2,3-triazolyl, 1,2,4-triazolyl, 1,2,4-thiadiazolyl, 1,3,4-thiadiazolyl or 1,3,5-triazinyl, R_1 is C_1–C_6alkyl unsubstituted or substituted by hydroxy, sulfo, sulfato, carboxy, cyano, halogen, C_1–C_4alkoxycarbonyl, C_1–C_4alkanoyloxy or carbamoyl, and uninterrupted or with the exception of methyl interrupted by a group —O—, or is phenyl or phenyl which is substituted by sulfo, carboxy, C_1–C_4alkyl, C_1–C_4alkoxy or halogen, R_2 independently has the meaning of R_1 or is hydrogen,

X is —O— or —NR_3,

R_3 is hydrogen or C_1–C_4alkyl,

R_4 is hydrogen or C_1–C_4alkyl and

p and q are each independently of the other 0 or 1.

4,962,192

CHEMILUMINESCENT 1,2-DIOXETANE COMPOUNDS

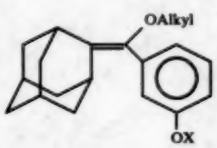
Arthur P. Schaap, Detroit, Mich., assignor to Board of Governors of Wayne State University, Detroit, Mich.

Continuation of Ser. No. 887,139, Jul. 17, 1986. This application Dec. 29, 1988, Ser. No. 290,373

Int. Cl.[5] C07C 13/68; C07H 3/00

U.S. Cl. 536—18.1 **10 Claims**

3. A compound of the formula:



wherein Alkyl contains 1 to 8 carbon atoms and wherein —OX is selected from the group consisting of hydroxyl, trialkylsilyloxy, alkyl diphenyl silyloxy, inorganic oxy acid salt, oxygen-pyranoside, phenyl esters and alkyl esters.

4,962,193
PROCESS FOR PURIFYING 2',3'-DIDEOXYNUCLEOSIDES

Kenzo Yokozeki; Hideyuki Shirae; Hiroshi Shiragami; Yasuo Irie; Naohiko Yasuda; Masaru Otani, and Toshiya Tanabe, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Division of Ser. No. 191,370, May 9, 1988. This application Dec. 28, 1988, Ser. No. 291,155

Claims priority, application Japan, Jun. 16, 1987, 62-149893; Dec. 22, 1987, 62-324882

Int. Cl.[5] C07H *17/00, 19/00, 19/06;* B01D *15/08*

U.S. Cl. 536—24 16 Claims

1. A process for the purification of a 2',3'-dideoxynucleoside from a solution obtained from a process requiring a microorganism or an enzyme, said solution containing, as impurities, other 2',3'-dideoxynucleosides or nucleic acid bases, said process comprising:

(i) contacting said solution with a porous, nonpolar resin to cause the adsorption of said 2',3'-dideoxynucleoside onto said porous nonpolar resin, wherein said 2',3'-dideoxynucleoside is 2',3'-dideoxyadenosine or 2',3'-dideoxyinosine;

(ii) separating said porous nonpolar resin from said solution; and

(iii) fractionally eluting said adsorbed 2',3'-dideoxynucleoside to obtain a purified 2',3'-dideoxynucleoside product.

4,962,194
METHOD OF PREPARING 5',N6-DISUBSTITUTED ADENOSINES FROM INOSINES

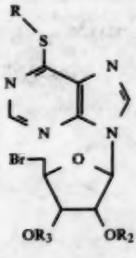
Alexander J. Bridges, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 34,125, Apr. 2, 1987, abandoned. This application Oct. 19, 1988, Ser. No. 260,202

Int. Cl.[5] C07H *19/167, 19/20*

U.S. Cl. 536—26 5 Claims

1. A process for the preparation of a compound of the formula (I)



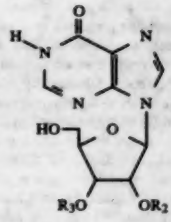
I

wherein

R is alkyl of from one to six carbons, aryl, heteroaryl or aralkyl,

R^2 and R^3 are independently hydrogen, alkyl of from one to six carbons, alkanoyl of from two to six carbons, benzoyl, and R^2 and R^3 are taken together to form alkylidene of from one to six carbons;

which comprises treating a compound of the formula (II)



II

wherein R_2 and R_3 are as defined above with the proviso that R_2 and R_3 are not hydrogen

with Ar_3PBr_2 or $(ArO)_3PBr_2$ wherein Ar is aryl in a solution and then RSH wherein R is as defined above;

and optionally deprotecting to obtain the compound of formula I defined above.

4,962,195
SOLVATE OF CEFADROXYL

Leonardo Marsili, Milan, Italy, assignor to Rifar S.R.L., Milan, Italy

Continuation of Ser. No. 43,494, Apr. 28, 1987, abandoned. This application Mar. 13, 1989, Ser. No. 323,129

Int. Cl.[5] C07D *501/22*

U.S. Cl. 540—230 2 Claims

1. Cefadroxyl solvate of N-methyl-2-pyrrolidone.

4,962,196
(3S, 4R)-3,4-TRANS-DISUBSTITUTED AZETIDIN-2-ONE INTERMEDIATES

Ernst Hungerbühler, Rheinfelden, and Jaroslav Kalvoda, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

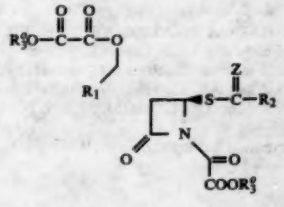
Continuation of Ser. No. 203,534, May 24, 1988, which is a continuation of Ser. No. 902,804, Sep. 2, 1986, abandoned. This application Mar. 24, 1989, Ser. No. 331,072

Claims priority, application Switzerland, Sep. 11, 1985, 3928/85-3; Mar. 6, 1986, 919/86-5

Int. Cl.[5] C07D *205/09, 403/12, 417/12;* C07B *51/00*

U.S. Cl. 540—357 8 Claims

1. A compound of the formula



wherein

R_1 is hydrogen or lower alkyl;

R_2 is an organic radical consisting of up to 18 carbon atoms, up to 5 nitrogen atoms, up to 5 oxygen atoms, up to 3 sulfur atoms, up to 3 halogen atoms and a commensurate number of hydrogen atoms; selected from Group (I) consisting of lower alkyl-X-, lower alkenyl-X, cyclo-lower alkyl-X-, cylco-lower alkenyl-X-, aryl-X-, aryl-lower alkyl-X-, aryl-lower alkenyl-X-, heterocyclyl-X-, heterocyclyl-lower alkyl-X-, heterocyclyl-lower alkenyl-X-, heterocyclyl-X-lower alkyl and heterocyclyl-X-lower alkenyl, wherein

each X is independently a bond, an oxygen atom or a sulfur atom;

each heterocyclyl group consisting of an aromatic monocy-

clic 5- to 6-membered heteroaryl radical selected from the group consisting of monoaza-, diaza-, triaza-, tetraza-, oxa-, oxaaza, oxadiaza-, oxatriaza-, monothia-, thiaza-, thiadiaza-, or thiatriazacyclic radical, a dihydro or tetrahydro radical thereof, and an unsaturated or partially saturated monobenzoo, dibenzo, pyrido, or pyrimido derivative of such 5- or 6-membered radical;

each of the aforesaid (I) being unsubstituted or substituted by up to three substituents which are the same or different such that the resultant substituted R_2 group consists of up to 18 carbon atoms, up to 5 nitrogen atoms, up to 5 oxygen atoms, up to 3 sulfur atoms, up to 3 halogen atoms and a commensurate number of hydrogen atoms;

each of said substituents being selected from:

(a) hydroxy, lower alkoxy, phenyl-lower alkoxy, lower alkanoyloxy, halogen, mercapto, lower alkylthio, and phenylthio;

(b) lower alkyl which is unsubstituted or substituted by hydroxy, lower alkoxy, carboxy, lower alkoxycarbonyl, carbamoyl, amino, lower alkylamino, di-lower alkylamino, lower alkyleneamino, lower alkanoylamino, mercapto, lower alkylthio, sulfo, or lower alkoxycarbonylamino, said lower alkoxycarbonylamino being unsubstituted or substituted by amino, by carboxy, or by both amino and carboxy;

(c) lower alkylene, unsubstutited or lower alkylated aza-lower alkylene, oxa-lower alkylene, di-oxa lower alkylene, and thia-lower alkylene;

(d) amino, lower alkylamino, di-lower alkylamino, lower alkyleneamino, guanidino, and carbamoylamino;

(e) lower alkanoylamino and lower alkoxycarbonylamino, each of which is unsubstituted or substituted by at least one substituent selected from amino and carboxy;

(f) carboxy, lower alkoxycarbonyl, carbamoyl, N-mono-lower alkylcarbamoyl, N,N-di-lower alkylcarbamoyl, cyano, sulfo, and sulfamoyl;

(g) phenyl which is unsubstituted or substituted by at least one substituent selected from lower alkyl, nitro, amino, hydroxy, lower alkoxy, carboxy, and halogen; and

(h) cycloalkyl, nitro, oxo, and oxido; "lower", in each case indicating up to and including 7 carbon atoms;

R_3^o is a conventional carboxyl protecting group; and

Z is oxygen or sulfur;

and when R_2 contains a functional group it is unprotected or has at least one of its functional groups protected by a conventional penem protecting moiety.

4,962,197

PHOTO-INACTIVATION OF CANCER CELLS

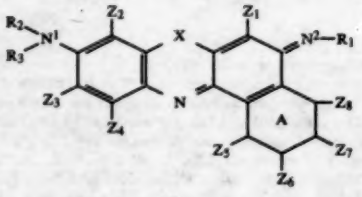
James W. Foley, and Louis Ciacotta, both of Andover, Mass., assignors to Rowland Institute for Science, Cambridge, Mass.

Filed Feb. 12, 1988, Ser. No. 157,214

Int. Cl.[5] C07D *265/38, 279/18*

U.S. Cl. 544—31 **13 Claims**

1. A compound having the formula



wherein

X is O, S, or Se; each R_1, R_2, and R_3, independently, is H, lower alkyl, or aralkyl; ring A is a saturated or unsaturated ring; and each Z_1, Z_2, Z_3, Z_4, Z_5, Z_6, Z_7, and Z_8, independently, is H or a halogen,

provided that when X is 0, at least one group Z is a halogen; when either Z_2 or Z_3 is a halogen, at least one of R_2 or R_3 is H; and when both Z_2 and Z_3 are halogens, both R_2 and R_3 are H; or a pharmaceutically acceptable salt thereof.

4,962,198

PROCESS FOR THE HYDROXYLATION OF ELECTROPHILIC AROMATIC COMPOUNDS

Mieczyslaw Makosza, and Krzysztof Sienkiewicz, both of Warsaw, Poland, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 7, 1989, Ser. No. 376,496

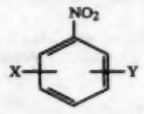
Claims priority, application Poland, Jul. 27, 1988, 273927

Int. Cl.[5] C07D *253/07, 277/68, 213/26, 215/26*

U.S. Cl. 544—182 **11 Claims**

1. A process for the hydroxylation of an electrophilic aromatic compound, which process comprises reacting the electrophilic aromatic compound with an organic hydroperoxide in the presence of a base, wherein the electrophilic aromatic compound is

(a) a nitrobenzene for the formula



in which X and Y, independently of one another, are hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylmercapto, di-C_1–C_4-alkylamino, cyano, C_1–C_4-alkylsulphonyl, carboxyl, nitro or hydroxyl, with the proviso that X and Y may not simultaneously be C_1–C_4-alkoxy and/or di-C_1–C_4-alkylamino and that if one of the two substituents X or Y is hydroxyl, the other substituent Y or X must be nitro;

(b) a 1- or 2-nitronaphthalene;

(c) an aromatic heterocyclic compound containing a nitro group, wherein said aromatic heterocyclic compound is 2-nitrothiophene, 3-nitrothiophene, 2-nitrofuran, N-alkylated or -arylated 2- or 3-nitropyrrole, 2-, 3- or 4-nitropyridine or 5-, 6- or 8-nitroquinoline, or

(d) acridine, benzothiazole or 1, 2, 4-triazine.

4,962,199

PYRIDAZINES BY MAGNESIUM HALIDE CATALYZED CYCLIZATION

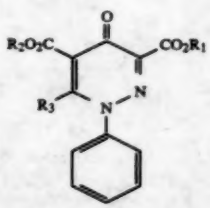
Gopi Yalamanchili, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 334,030, Apr. 6, 1989, abandoned. This application Feb. 1, 1990, Ser. No. 473,140

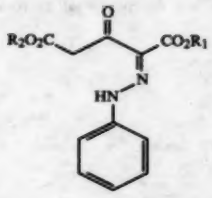
Int. Cl.[5] C07D *237/02*

U.S. Cl. 544—239 **10 Claims**

1. A process for making a compound having the formula:



wherein R_1 and R_2 are each independently a lower alkyl and R_3 is a lower alkyl, benzyl or phenyl; which comprises the step of reacting the starting compound having the formula:



with R_3COA wherein A is halo, in the presence of a base and at least about 0.25 molar equivalents of MgX_2, wherein X is Cl, Br or I, for each mole of starting compound and the phenyl ring of the starting compound is unsubstituted or substituted with one to three substituents which do not interfere with the process.

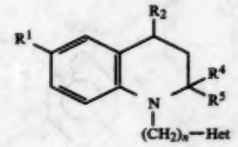
4,962,200

NITROGEN-CONTAINING COMPOUND

Noriaki Kihara, Iwakuni; Ikuo Tomino; Hiroaki Tan, both of Otake, and Takafumi Ishihara, Toyonaka, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

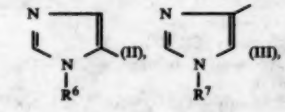
Filed Apr. 29, 1988, Ser. No. 188,219
Claims priority, application Japan, Apr. 30, 1987, 62-104753
Int. Cl.[5] C07D *401/06*
U.S. Cl. 544—333 **19 Claims**

1. A nitrogen-containing compound represented by the following formula (I) or a pharmacologically acceptable salt thereof:

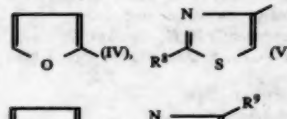


(I)

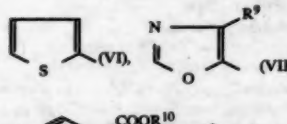
wherein R^1 stands for a hydrogen atom, a halogen atom or a lower alkyl group, R_2 stands for a hydrogen atom or a methyl group, R^4 and R^5 independently stands for a hydrogen atom or a lower alkyl group, n is an integer of from 1 to 3, and Het is a group represented by one of the following formula (II) through (X):



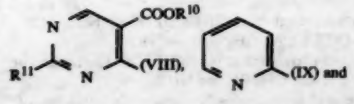
(II), (III),



(IV), (V),

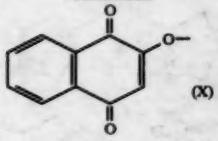


(VI), (VII),



(VIII), (IX) and

-continued



(X)

in which R^6 stands for a lower alkyl group, R^7 stands for a di-lower-alkyl-group-substituted carbamoyl group, R^8, R^9 and R^{10} independently stand for a lower alkyl group and R^{11} stands for a hydrogen atom, a lower alkyl group or a phenyl group, with the proviso that when n is at least 2, Het is a group represented by formula (IV) or formula (X), and when R^1 stands for a halogen atom or a lower alkyl group, Het is a group represented by formula (IV).

4,962,202

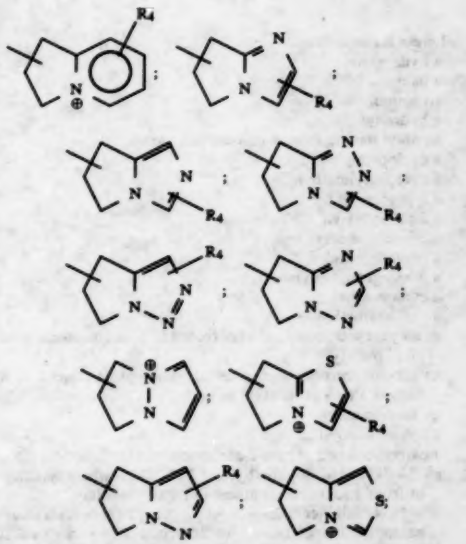
MERCAPTO-BICYCLOHETEROCYCLICS USEFUL AS INTERMEDIATES FOR PENEM DERIVATIVES

Makoto Sato; Makoto Takemura; Kunio Higashi; Tsunehiko Soga; Hiroo Matsumoto, and Toshiyuki Nishi, all of Tokyo, Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

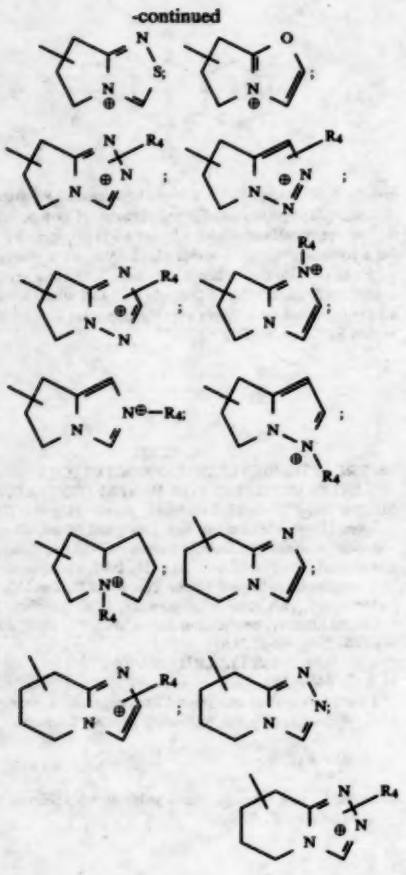
Division of Ser. No. 38,640, Apr. 15, 1987, abandoned, which is a continuation-in-part of Ser. No. 875,228, Jun. 17, 1986, abandoned. This application Jan. 11, 1988, Ser. No. 117,617
Claims priority, application Japan, Jun. 17, 1985, 60-131394; Sep. 26, 1985, 60-213420
Int. Cl.[5] C07D *235/02, 249/16*
U.S. Cl. 546—112 **2 Claims**

1. A intermediate compound for preparing a penem derivative, represented by the following general formula:

wherein R_3 is a bicycloheterocyclic group selected from the group consisting of:



-continued



wherein R_4 represents:
a hydrogen,
a halogen,
an amino,
a hydroxyl,
an alkyl having from 1 to 4 carbon atoms,
a cyclopropylmethyl,
a cyclobutylmethyl,
a 2-propen-1-yl,
a 2-propyn-1-yl,
a 2-halogenoethyl,
a phenylmethyl,
a 4-halogenophenylmethyl,
a cyanomethyl,
a carboxymethyl,
an alkyloxycarbonylmethyl of from 1 to 4 carbon atoms in its alkyl moiety,
an alkyloxycarbonylmethylcarbonylmethyl of from 1 to 4 carbon atoms in its alkyl moiety
an acetylmethyl,
a benzoylmethyl,
a carbamoylmethyl or a 2-carbamoylethyl,
an N-alkylcarbamoylmethyl or 2-(N-alkylcarbamoyl)ethyl of from 1 to 3 carbon atoms in its alkyl moiety,
an N,N-dialkylcarbamoylmethyl or 2-(N,N-dialkylcarbamoyl)-ethyl of from 1 to 3 carbon atoms in its alkyl moiety, or
an N-methyltetrazolyl-5-yl-thiomethyl, or
a pharmaceutically acceptable salt thereof.

4,962,203

2-SUBSTITUTED QUINOLINES USEFUL AS LEUKOTRIENE ANTAGONISTS

Robert N. Young, Quebec; Hayda W. R. Williams; Serge Leger, both of Dollard des Ormeaux; Richard Frenette, Laval, and Robert Zamboni, Longueuil, all of Canada, assignors to Merck Frost Canada, Inc., Kirkland, Canada

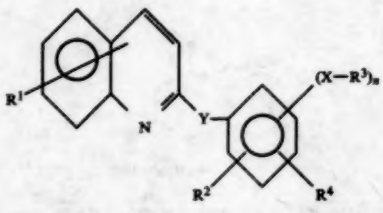
Continuation of Ser. No. 253,993, Oct. 5, 1988, abandoned, which is a continuation of Ser. No. 874,243, Jun. 13, 1986, abandoned, which is a continuation-in-part of Ser. No. 746,204, Jun. 18, 1985, abandoned. This application Aug. 14, 1989, Ser. No. 393,436

Int. Cl.[5] C07D *215/18;* A61K *31/47*

U.S. Cl. 546—180 **9 Claims**

1. A compound of the formula:

I



wherein:
R^1 is H, halogen, C_1–C_8 alkyl, C_2–C_8 alkenyl, C_2–C_8 alkynyl, —CF_3, —OR^2, SR^2, —CHO, —$COOR^2$, —(C═O)R^2, —C(OH)R^2R^2, —CN, substituted or unsubstituted phenyl, substituted or unsubstituted benzyl, or substituted or unsubstituted phenethyl;
R^2 is independently H, C_1–C_8 alkyl, C_2–C_8 alkenyl, C_2–C_8 alkynyl, or —CF_3;
R^3 is independently $(CR^2R^2)_m$—Q;
R^4 is independently H, halogen, —CN, —OR^2, —SR^2, or C_1–C_8 alkyl;
R^9 is independently —OR^{10}, —SR^{10}, or —$NR^{10}R^{10}$;
R^{10} is independently H, C_1–C_6 alkyl, —(C═O)R^{11}, unsubstituted phenyl or unsubstituted benzyl;
R^{11} is independently H, C_1–C_8 alkyl, C_2–C_8 alkenyl, C_2–C_8 alkynyl, —CF_3, or unsubstituted phenyl, benzyl, or phenethyl;
m is independently 1–4;
n is independently 1 or 2;
Q is independently —$COOR^2$ or tetrazole;
X is independently O, S, —SO, or —SO_2;
Y is independently —$(CR^2{=}CR^2)_n$—, or —$(C{\equiv}C)_n$—;
substituted phenyl, benzyl, and phenethyl mean 1–2 substituents selected from C_1–C_6 alkyl, R^9, NO_2, SCF_3, halogen, —COR^9, CN, CF_3, and —CHO;
with the proviso that when R^4 is on the carbon adjacent to X it is not OH, SH, or NHR^2;
and the pharmaceutically acceptable salts thereof.

4,962,204

PREPARATION OF ALPHA-PYRROLIDONES AND THEIR IMINES

Ludwig Wambach, Heidelberg, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

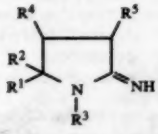
Division of Ser. No. 177,846, Mar. 28, 1988, Pat. No. 4,855,444, which is a division of Ser. No. 90,451, Aug. 28, 1987, abandoned. This application Apr. 25, 1989, Ser. No. 315,158

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1986, 3631414

Int. Cl.[5] C07D *207/26*

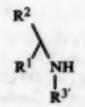
U.S. Cl. 548—408 5 Claims

1. The process for the preparation of an α-pyrrolidone imine of the formula Ib



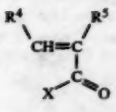
(Ib)

where R^1 and R^2 are each C_1–C_8-alkyl, C_1–C_8-alkoxy, C_3–C_{10}-cycloalkyl or C_{3-C10}-cycloalkoxy and R^1 and R^2 together may form a ring having, in particular, from 4 to 7 ring carbon atoms, R^3 is hydrogen, C_1–C_6-alkyl, phenyl or naphthyl and R^4 and R^5 are each hydrogen or C_1–C_4-alkyl, wherein an amine of the formula II



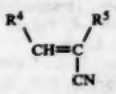
(II)

where $R^{3'}$ is hydrogen, tert-butyl, phenyl or naphthyl, is reacted with an α,β-unsaturated carboxylic acid derivative of the formula III



(III)

where X is —OR′, —NR′RΔ—NHR′ or —NH_2, in which R′ and R″ are each C_1–C_8alkyl, C_3–C_3-cycloalkyl or phenyl, or with an α,β-unsaturated nitrile of the formula IV



(IV)

in the presence of a free radical initiator, and where $R^{3'}$, is hydrogen and it is intended to prepare a compound in which R^3 is C_1–C_6-alkyl, the product obtainable in this procedure is reacted with an alkylating agent to introduce a C_1–C_6-alkyl group.

4,962,205

METHOD FOR TRANSPORTATION AND STORAGE OF N-PHENYL MALEIMIDE IN MOLTEN FORM

Yuichi Kita, Akashi; Kazuo Kishino, Himeji, and Akio Fukui, Fujisawa, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo, Co., Ltd., Osaka, Japan

Filed Aug. 11, 1989, Ser. No. 392,482

Int. Cl.[5] C07D *207/448*

U.S. Cl. 548—549 4 Claims

1. A method of providing N-phenyl maleimide in a form suitable for transportation or storage, which comprises melting maleic anhydride in the presence of a polymerization inhibitor, adding thereto N-phenyl maleimide and maintaining the temperature of the mixture at a temperature sufficient to maintain said mixture in a molten state in the range of 35° to 100° C., wherein the ratio of maleic anhydride to N-phenyl maleimide lies in the range of 1 to 90:99 to 10 and the amount of polymerization inhibitor is in the range of 0.0001 to 0.5% by weight, based on said mixture of N-phenyl maleimide with maleic anhydride.

3. A molten N-phenyl maleimide composition comprising molten maleic anhydride in the presence of a polymerization inhibitor and N-phenyl maleimide at the temperature of the mixture being sufficient to maintain said mixture in a molten state in the range of 35° to 100° C.,wherein the ratio of maleic anhydride to N-phenyl maleimide lies in the range of 1 to 90:99 to 10 and the amount of polymerization inhibitor is in the range of 0.0001 to 0.5% by weight, based on said mixture of N-phenyl maleimide with maleic anhydride.

4,962,206

PROCESS FOR THE PREPARATION OF 4-BROMOPHTHALIC ANHYDRIDE

Mary K. Cocoman, and Willis T. Schwartz, both of Grand Island, N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Nov. 20, 1989, Ser. No. 439,299

Int. Cl.[5] C07D *307/77*

U.S. Cl. 549—246 10 Claims

1. A process for the production of a mixture of 4-chlorophthalic anhydride and 4-bromophthalic anhydride which comprises the reaction of 4-chlorotetrahydrophthalic anhydride, in a suitable solvent, with elemental bromine in the presence of a catalytically effective amount of a catalyst selected from the group consisting of elemental iron and iron salts.

4,962,207

ORGANIC DERIVATIVES OF TELLURIUM AND SELENIUM

Michael Albeck, Ramat Gan, and Benjamin Sredni, Bnei Brak, both of Israel, assignors to Bar-Ilan University, Ramat-Gan, Israel

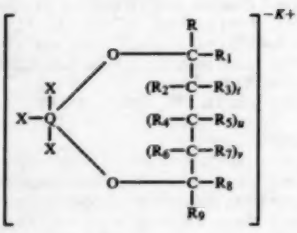
Continuation-in-part of Ser. No. 782,129, Sep. 30, 1985, Pat. No. 4,761,490, which is a continuation-in-part of Ser. No. 712,549, Mar. 15, 1985, abandoned, which is a continuation-in-part of Ser. No. 599,511, Apr. 12, 1984, abandoned. This application Oct. 9, 1987, Ser. No. 107,131

The portion of the term of this patent subsequent to Jun. 21, 2005, has been disclaimed.

Int. Cl.[5] C07D *321/02, 321/12, 317/08, 319/04*

U.S. Cl. 549—334 4 Claims

1. A compound of the formula:



(A)

wherein Q is Te or Se; t is 1 or 0; u is 1 or 0; v is 1 or 0; R, R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, and R_9 are the same or different and are independently selected from the group consisting of hydrogen, hydroxyalkyl of 1 to 5 carbons, hydroxy, alkyl of from 1 to 5 carbon atoms, halogen, haloalkyl of 1 to 5 carbon atoms, carboxy, alkylcarbonylalkyl of 2 to 10 carbons, alkanoyloxy of 1 to 5 carbon atoms, carboxyalkyl of 1 to 5 carbon atoms, acyl, amido, cyano, amidoalkyl of 1 to 5 carbons N-monoalkylamidoalkyl of 2 top 10 carbons, N,N-dialkylamido-alkyl of 4 to 10 carbons, cyanoalkyl of 1 to 5 carbons, alkoxy of 1 to 5 carbon atoms, alkoxyalkyl of 2 to 10 carbon atoms and —COR_{10} wherein R_{10} is alkyl of from 1 to 5 carbons; and X is halogen.

4,962,208

METHOD FOR PREPARING TIME-STABLE SOLUTIONS OF NON-PYROGENIC MAGNESIUM GLUCONOCITRATES

Alfred R. Globus, 26-53 210th St., Bayside, Queens, N.Y. 11360

Continuation-in-part of Ser. No. 203,513, May 27, 1988, abandoned, which is a continuation of Ser. No. 65,654, Jun. 24, 1987, abandoned, which is a continuation of Ser. No. 863,428, May 15, 1986, abandoned, which is a continuation-in-part of Ser. No. 778,209, Sep. 20, 1985, abandoned. This application Jan. 6, 1989, Ser. No. 293,990

Int. Cl.[5] C07D *313/00*

U.S. Cl. 549—266 **14 Claims**

1. A method for producing a timestable non-pyrogenic magnesium gluconocitrate solution which comprises admixing non-pyrogenic magnesium hydroxy-carbonate, gluconic acid anhydride and citric acid to form a powder; adding said powdered admixture to an aqueous medium which has been preheated to a temperature of about 80° C. to about 85° C. and is contained in an unsealed vessel, maintaining the resulting mixture at a temperature of about 80° C. to about 85° C. until said ingredients have reacted to form magensium gluconocitrate and carbon dioxide, allowing substantially all of the carbon dioxide to escape from said solution before sealing said vessel, wherein said magnesium hydroxycarbonate has been prepared by drying the magnesium hydroxycarbonate in the form of thin layers in the presence of air and steam at about 165° C. for about 18 hours whereby all traces of organic material are eliminated by oxidation thereof.

4,962,209

DIHYDROPYRAN DERIVATIVES

Ralph W. Turner, Cheadle, England, assignor to Imperial Chemical Industries PLC, London, England

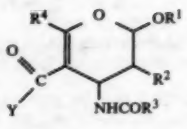
Filed Mar. 2, 1987, Ser. No. 20,960

Claims priority, application United Kingdom, Mar. 5, 1986, 8605413

Int. Cl.[5] C07D *309/30*

U.S. Cl. 549—419 **7 Claims**

1. A dihydropyran derivative of the formula I



(I)

wherein:

R^1 is alkyl, cycloalkyl (which alkyl and cycloalkyl groups may be optionally substituted by one or more halogen atoms or alkoxy groups), phenyl (optionally substituted by one or more of halogen, C_{1-6} alkyl, C_{1-4} alkoxy or C_{2-6} alkoxycarbonyl), phenylalkyl or silyl (bearing alkyl, phenyl or phenylalkyl substituents);

R^2 is hydrogen or alkyl;

R^3 is hydrogen, alkyl, cycloalkyl (which alkyl and cycloalkyl groups may be optionally substituted by one or more of halogen or alkoxy), phenyl, phenylalkyl or a group of the formula —OR^5 wherein R^5 is alkyl, alkyl substituted by halogen, phenyl or phenylalkyl;

R^4 is alkyl optionally substituted by one or more alkoxy groups or halogen atoms;

Y is alkoxy or cycloalkoxy (which alkoxy and cycloalkoxy groups may be optionally substituted by carboxy or C_{1-4} alkoxycarbonyl), phenylalkoxy or a group of the formula —NR^6R^7 wherein R^6 is hydrogen or alkyl and

R^7 is alkyl, cycloalkyl (which alkyl and cycloalkyl groups may be substituted by one or more halogen atoms or alkoxy groups), phenyl or phenylalkyl or R^7 is a group of the formula —$COOR^8$ wherein R^8 is alkyl or phenylalkyl.

4,962,210

PROCESS FOR THE PREPARATION OF HIGH-PURITY TETRAHYDROFURAN

Stephen N. Falling, and Bruce L. Gustafson, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 2, 1990, Ser. No. 503,504

Int. Cl.[5] C07D *307/08*

U.S. Cl. 549—429 **5 Claims**

1. Process for the preparation of high-purity tetrahydrofuran from a mixture of 2,5-dihydrofuran and 3,4-epoxy-1-butene and/or crotonaldehyde which comprises the steps of (1) hydrogenating the mixture in the presence of a nickel or platinum catalyst to obtain a mixture consisting essentially of tetrahydrofuran and 1-butanol and (2) separating the tetrahydrofuran from the 1-butanol.

4,962,211

NOVEL BIPHENYL DERIVATIVE AND PRODUCTION AND USE THEREOF

Yoshiyuki Matsuoka; Kunio Hosaka; Shigefumi Takeda, and Hiroshi Mitsuhashi, all of Tokyo, Japan, assignors to Tsumura & Co., Tokyo, Japan

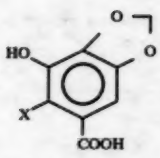
Division of Ser. No. 180,107, Feb. 10, 1988, Pat. No. 4,904,694. This application Nov. 21, 1989, Ser. No. 445,977

Claims priority, application Japan, Jun. 13, 1986, 61-136262; Aug. 5, 1986, 61-182628; PCT Int'l Appl., Jun. 13, 1987, PCT/JP87/00387

Int. Cl.[5] C07D *317/06*

U.S. Cl. 549—436 **2 Claims**

1. A compound having the following formula (V):



wherein X represents a halogen atom.

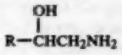
4,962,212

PROCESS FOR THE PREPARATION OF 2-(2-FURYL)ETHANOL AMINE

Lowell R. Smith, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 26, 1989, Ser. No. 457,055
Int. Cl.[5] C07D *307/14, 307/54*
U.S. Cl. 549—491 **8 Claims**

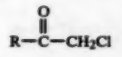
1. Process for preparation of compounds of the formula



I

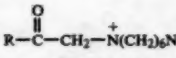
wherein R represents a 2- or 3-furyl or tetrahydrofuryl radical which may be substituted with a lower alkyl group, which comprises:

(a) reacting a compound of the formula



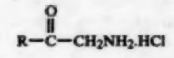
II

with hexamethylene tetraamine and tetrabutylammonium bromide or iodide to produce a compound of the formula



III

(b) reacting the compound of Formula III with an alcoholic solution of HCl to form a compound of the formula



IV

(c) reacting the compound of Formula IV with water or an aqueous alcoholic solution of Raney nickel into which solution hydrogen is introduced followed by introduction of an alkaline material and recovering the compound of Formula I.

4,962,213

ENERGETIC AZIDO CURING AGENTS

Milton B. Frankel, Tarzana; Edgar R. Wilson, Simi Valley, and Dean O. Woolery, II, Reseda, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 64,735, Jun. 22, 1987, abandoned. This application Feb. 6, 1989, Ser. No. 314,694
Int. Cl.[5] C07C *247/04*
U.S. Cl. 552—12 **2 Claims**

1. As a composition of matter the isocyanate-terminated aliphatic polymer having a structural formula of

(V)

wherein n is an integer from 1 to about 20.

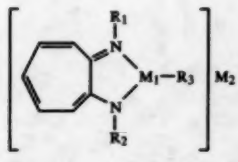
4,962,214

CATALYTIC ENANTIOSELECTIVE ADDITION OF HYDROCARBON EQUIVALENTS TO ALPHA, BETA-UNSATURATED CARBONYL COMPOUNDS

Gilberto M. Villacorta, Hoboken, N.J.; Kwang-Hyun Ahn, Somerville, and Stephen J. Lippard, Cambridge, both of Mass., assignors to Massachusettes Institute of Technology, Cambridge, Mass.

Filed May 11, 1988, Ser. No. 193,246
Int. Cl.[5] C07F *1/08*
U.S. Cl. 556—33 **9 Claims**

1. An optically active organometallic complex of the formula:



wherein R_1 and R_2 are the same or different and are chiral hydrocarbon groups in which there are 4 to 24 carbon atoms and said groups containing heteroatom substituents, R_3 is a halogen or a hydrocarbon of 1 to 24 carbon atoms, M_1 is copper and M_2 is an alkaline metal or an alkaline-earth metal halide.

4,962,215

PROCESS OF PREPARATION OF ENOLIC COMPOUNDS AND NEW PRODUCTS OBTAINED

Gérard Cahiez, Bruno Figadere, and Pierre Tozzolino, Serres-Morlaas, both of France, assignors to Societe Nationale Elf Aquitaine, France

Filed Dec. 16, 1988, Ser. No. 285,532
Claims priority, application France, Dec. 2, 1988, 88 15806
Int. Cl.[5] C07F *13/00*
U.S. Cl. 556—45 **19 Claims**

1. Process of preparation of an enolic derivative from a ketone by contact thereof with an organo metallic compound, characterised in that the organo metallic compound is a mixed organo-manganous compound and the derivative formed is an Mn enolate.

4,962,216

PREPARATION OF DINEOPENTYLCADMIUM

Kelvin T. Higa, and Daniel C. Harris, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 164,311, Mar. 4, 1988, abandoned. This application Sep. 29, 1989, Ser. No. 417,222
Int. Cl.[5] C07F *3/08*
U.S. Cl. 556—129 **26 Claims**

1. A method for preparing dineopentylcadmium, comprising the steps of:

(a) adding cadmium dihalide to at least two equivalents of neopentyl magnesium halide in a solvent under inert atmosphere and darkened conditions;

(b) refluxing the reaction mixture;

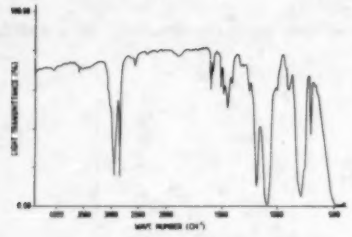
(c) adding dioxane to the reaction mixture;
(d) filtering the reaction mixture to obtain a solid fraction and a liquid fraction thereof containing the product;
(e) distilling said liquid fraction under inert atmosphere to remove said solvent, leaving a crude product; and
(f) subliming the crude product to yield dineopentylcadmium.

4,962,217

ORGANOSILICON COMPOUNDS HAVING A MERCAPTO GROUP IN THE MOLECULE

Seizi Katayama, and Hiroshi Kanbara, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Japan

Filed Jan. 4, 1990, Ser. No. 460,788
Claims priority, application Japan, Jan. 13, 1989, 1-6426
Int. Cl.[5] C07F 7/08, 7/18
U.S. Cl. 556—429 **9 Claims**



1. An organosilicon compound of the following general formula

$$HSCH_2C_6H_4(CH_2)_nSi(CH_3)_{3-m}(OR)_m$$

wherein R represents a methyl group or an ethyl group, n is a value of 0,1 or 2, and m is a value of 1, 2 or 3.

4,962,218

SILICONE POLYETHER COPOLYMERS AND POLYURETHANE FOAMS PREPARED THEREFROM

Charles H. Blevins, Beacon; George H. Greene, Croton-on-Hudson; Paul L. Matlock, Ossining, and Gerald J. Murphy, Wappingers Falls, all of N.Y., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Nov. 7, 1988, Ser. No. 268,187
Int. Cl.[5] C07F 7/08, 7/10, 7/18
U.S. Cl. 556—445 **45 Claims**

1. A silicone polyether copolymer surfactant comprised of a polyether backbone having an average at least three pendant groups of the formula:

$$-SiR'_cO_{\frac{(3-c)}{2}}R''_b$$

attached to said polyether backbone through a divalent aliphatic group having 2 to 10 carbon atoms and which may contain at least one heteroatom of the group of O, N and S, said heteroatom being located within said divalent aliphatic group and wherein R' represents C_1–C_3, R'' or OR'''; R'' represents

$$SiR'_cO_{\frac{4-c}{2}}$$

and R''' represents C_1–C_3; and a, b and c have a value from 0 to 3; said silicone polyether copolymer surfactant being characterized by

(a) a narrow uni-modal distribution;
(b) being essentially free of silicone oils and process polyethers; and
(c) any unreacted unsaturated groups on said polyether backbone are deactivated.

4,962,219

ALKYLATION OF HALODISILANES

Roland L. Halm, Madison; Kirk M. Chadwick, Hanover, both of Ind., and Brian R. Keyes, Salt Lake City, Utah, assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 258,949, Oct. 17, 1988, abandoned. This application Nov. 17, 1989, Ser. No. 439,073
Int. Cl.[5] C07F 7/08
U.S. Cl. 556—468 **30 Claims**

1. A process for preparing more highly alkylated silicon compounds having the formula,

$$R_aR^i_bSiX_{(4-a-b)} \text{ or}$$

$$R_fR^i_gSi_2X_{(6-f-g)}$$

wherein each R is independently selected from a group consisting of methyl and ethyl, and n-propyl; each R^i is independently selected from a group consisting of hydrogen atoms, alkyl, substituted alkyl, alkenyl, aryl, and alkaryl groups; a has a value of 0, 1, 2, 3, or 4, b has a value of 0, 1, 2, 3, or 4, and the sum of a+b is 4 or less; f has a value of 0, 1, 2, 3, 4, 5, or 6, g has a value of 0, 1, 2, 3, 4, 5, or 6, and the sum of f+ g is 6 or less; the sum of a+f is greater than zero and less than 11; and X is an independently selected halogen atom, said process comprising

(A) contacting a halodisilane of silicon, having the formula,

$$R^i_eX_{6-e}Si_2,$$

or mixture thereof, wherein R^i and X are defined above; and e has a value of 0, 1, 2, 3, 4, or 5, with an alkyl halide, having the formula,

$$RX,$$

wherein R and X are defined above, in the presence of a metal which serves as a halogen acceptor;
(B) reacting the halodisilane with the alkyl halide in the presence of the metal at a temperature greater than about 150° C. to form the more highly alkylated silicon compound and a halide of the metal; and
(C) isolating and separating the more highly alkylated silane.

4,962,220

METHOD FOR PREPARING ORGANOHALOSILANES

Roland L. Halm, Madison, Ind., and Regie H. Zapp, Carrollton, Ky., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 20, 1990, Ser. No. 459,483
Int. Cl.[5] C07F 7/16
U.S. Cl. 556—473 **6 Claims**

1. In a method for increasing the yield of methyldichlorosilane obtained during the production of methylchlorosilanes by the reaction of a gaseous mixture comprising methyl chloride and hydrogen chloride with a reaction mass comprising silicon metal and a suitable catalyst at a temperature of from 250° to about 350° C., the improvement comprising homogeneously blending the methyl chloride and hydrogen chloride with an amount of gaseous hydrogen sufficient to reduce the concentration of methyltrichlorosilane in the product of said reaction.

4,962,221

CHLORIDE REDUCTION IN POLYSILOXANES

Arnold R. Huntress; Daryl D. Landis, both of Midland; Donald E. McVannel, Hemlock, all of Mich., and Timothy Allen, Evansville, Ind., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 12, 1990, Ser. No. 492,014
Int. Cl.[5] C07F 7/20
U.S. Cl. 556—456 15 Claims

1. A process for reducing residual chloride content of a polysiloxane fluid, the process comprising:

contacting the polysiloxane fluid with an alkaline metal compound selected from a group consisting of magnesium oxide, magnesium hydroxide, calcium oxide, calcium hydroxide, barium oxide, and barium hydroxide; the contact occurring at a contact temperature of 0° C. to 100° C.

4,962,222

PREPARATION PROCESS OF α-L-ASPARTYL-L-PHENYLALANINE METHYL ESTER HAVING LOW HYGROSCOPICITY

Ryuichi Mita; Toshio Katoh, both of Kawasaki; Chojiro Higuchi, Kamakura; Takeshi Oura, Zushi, and Akihiro Yamaguchi, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Continuation of Ser. No. 130,172, Dec. 8, 1987, abandoned. This application Jan. 25, 1989, Ser. No. 300,724
Claims priority, application Japan, Dec. 19, 1986, 61-301469
Int. Cl.[5] C07C 101/02
U.S. Cl. 560—41 8 Claims

1. A process for the preparation of type II α-L-aspartyl-L-phenylalanine methyl ester crystals having low hygroscopicity, which comprises the following consecutive steps:

(i) bringing a first cake of α-L-aspartyl-L-phenylalanine methyl ester, the first cake having been obtained by solid-liquid separation through a desired preparation process of α-L-aspartyl-L-phenylalanine methyl ester, into contact with an organic solvent of uniform phase which is dry or contains water in an amount up to 30 weight percent, thereby treating the first cake with the organic solvent;

(ii) subjecting the resultant mixture of the first cake and organic solvent to solid-liquid separation to obtain a second cake; and

(iii) drying the second cake at a temperature not higher than 60° C.

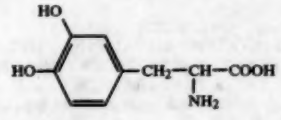
4,962,223

PROCESS FOR THE SYNTHESIS OF THE LEVODOPA

Vincenzo Cannata, Borgo Nuovo Pontecchio Marconi; Giancarlo Tamerlani, Potecchio Marconi, and Maur › Morotti, Marzabotto, all of Italy, assignors to Ministero dell'Universita e delle Ricerca Scientifica e Tecnologica, Rome, Italy

Filed Jul. 3, 1989, Ser. No. 375,131
Claims priority, application Italy, Jul. 12, 1988, 21322 A/88
Int. Cl.[5] C07C 255/33
U.S. Cl. 558—408 9 Claims

1. Process for the synthesis of the L-(−)-2-amino-3-(3,4-dihydroxyphenyl)propanoic acid of formula

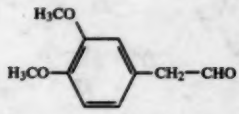


(VI)

L-(−)

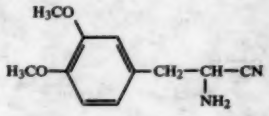
which comprises:

(a) reacting a molar equivalent of 3,4-dimethoxyphenylacetaldehyde of formula



(I)

with from about 1 to about 3 molar equivalents of an alkali metal cyanide and of ammonium chloride in presence of from about 3 to about 10 molar equivalents of ammonium hydroxide in aqueous solution, in presence of an organic solvent immiscible with water selected between the alkyl halides containing from 1 to 4 carbon atoms and the aromatic hydrocarbons, at a temperature comprised between about 30° C. and about 70° C. for a period of time comprised between about 1 and about 8 hours to give the d,l-2-amino-3-(3,4-dimethoxyphenyl)propionitrile of formula

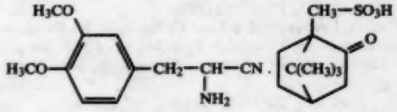


(II)

d,l

(b) resolving said d,l-aminonitrile of formula (II), or a salt thereof, by salification with from about 0.5 to about 2 molar equivalents of d-camphorsulfonic acid or of an ammonium, alkali metal or alkali-earth metal salt thereof, in water or in polar organic solvents or in mixtures thereof or in mixtures thereof with water, facultatively seeding with d-2-amino-3-(3,4-dimethoxyphenyl)propionitrile d-camphorsulfonate;

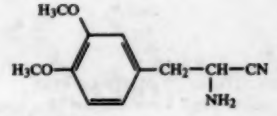
(c) treating the so obtained d-2-amino-3-(3,4-dimethoxyphenyl)propionitrile d-camphorsulfonate of formula



(III)

d d

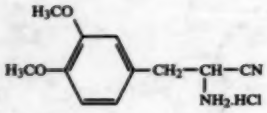
with a concentrated aqueous solution of ammonium hydroxide up to about pH 6.5 to obtain d-2-amino-3-(3,4-dimethoxyphenyl)propionitrile of formula



(IV)

d

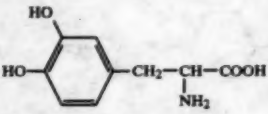
which, by treatment with aqueous hydrochloric acid gives the d-2-amino-3-(3,4-dimethoxyphenyl)propionitrile hydrochloride of formula



(V)

d

(d) hydrolyzing and demethylating the d-2-amino-3-(3,4-dimethoxyphenyl)propionitrile of formula (IV), or its salts of formula (III) and (V), by treatment with concentrated aqueous solutions of haloid acids or of mixtures thereof at temperatures comprised between about 40° C. and the boiling temperature of the reaction mixture for a period of time comprised between about 2 and about 12 hours, to obtain, after dilution with water, addition of concentrated aqueous solution of ammonium hydroxide up to pH 4.5 and cooling to a temperature comprised between about 0° C. and about 10° C., the desired L-(−)-2-amino-3-(3,4-dihydroxyphenyl)propanoic acid of formula



(VI)

L-(−)

8. A product which is the d-2-amino-3-(3,4-dimethoxyphenyl)propionitrile d-camphorsulfonate.

4,962,224

N-NAPHTHOYLGLYCINES AS ALDOSE REDUCTASE INHIBITORS

Jay E. Wrobel, Lawrenceville; John G. Bauman, E. Windsor, and Kazimir Sestanj, Monmouth Junction, all of N.J., assignors to American Home Products Corporation, New York, N.Y.

Filed Aug. 22, 1989, Ser. No. 397,623
Continuation of Ser. No. 137,403, Dec. 23, 1987, abandoned.
Int. Cl.[5] C07C 261/00
U.S. Cl. 560—28 2 Claims

1. The compound N-2-fluoro-6-methoxy-N-methyl-5-(trifluoromethyl)-1-naphthalenecarboxamide, or the pharmaceutically acceptable salt thereof.

4,962,225

ASPARTIC ACID DERIVATIVES

Yoshio Okada, Akashi; Koichi Kawasaki, and Shin Iguchi, both of Kobe, all of Japan, assignors to Hidehiko Watanabe, Hiroshima, Japan

Filed Apr. 1, 1988, Ser. No. 176,597
Int. Cl.[5] C07C 125/065
U.S. Cl. 560—163 4 Claims

1. An aspartic acid derivative which is N-α-t-butoxycarbonyl-aspartic acid-β-2-admantyl ester-α-benzyl ester.

4,962,226

PROCESS FOR THE SELECTIVE SEPARATION OF VINYLIDENE OLEFINS FROM MIXTURES WITH OTHER OLEFINS

Herbert Elliott Fried, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 101,317, Sep. 25, 1987, Pat. No. 4,822,911, which is a continuation-in-part of Ser. No. 812,417, Dec. 23, 1985, abandoned. This application Mar. 9, 1989, Ser. No. 321,117
The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.
Int. Cl.[5] C07C 69/52
U.S. Cl. 560—205 32 Claims

1. A process for the selective separation of a C_6 to C_{30} olefin mixture consisting essentially of an ethyl- and higher alkyl-branched vinylidene olefin component and a linear olefin component, and for the preparation of unsaturated alkyl esters of acrylic acids, which comprises steps for

(a) contacting the olefin mixture in the liquid phase at a temperature of between about 10° and 300° C. with one or more reactive agents selected from the group consisting of alkyl esters of acrylic acid in the presence of a catalytically effective amount of one or more ene reaction catalysts, to selectively convert all or part of the ethyl- and higher alkyl-branched vinylidene olefins of said mixture to higher alkyl acrylic acid esters and to produce a product mixture comprising the resulting higher acrylic acid esters and unreacted olefins,

(b) terminating step (a) prior to conversion of more than about 20% of the linear olefins by reaction with reactive agent, and

(c) separating the unreacted olefins from the product mixture.

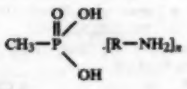
4,962,227

METHYLPHOSPHONIC ACID AMINE SALT LUBRICANT ADDITIVES

Hermann O. Wirth, Bensheim, and Klaus Müller, Lörrach, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 161,374, Feb. 22, 1988, Pat. No. 4,847,457, which is a division of Ser. No. 18,855, Feb. 24, 1987, abandoned, which is a continuation of Ser. No. 702,294, Feb. 15, 1985, abandoned. This application Apr. 26, 1989, Ser. No. 343,222
Claims priority, application Switzerland, Feb. 24, 1984, 911/84
Int. Cl.[5] C07F 9/38
U.S. Cl. 562—8 6 Claims

1. A compound of formula I



(I)

wherein n is an integer from 1.0 to 2.2 and R is a straight chain or branched C_8–C_{30} alkyl.

4,962,228

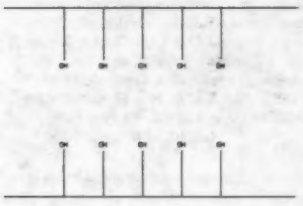
LAYERED DIVALENT METAL PHOSPHATES CONTAINING PENDENT SUBSTITUENT GROUPS AND THEIR PREPARATION

Stuart D. Hellring, Trenton, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 23,345, Mar. 9, 1987, Pat. No. 4,846,853. This application Dec. 29, 1987, Ser. No. 139,240
Int. Cl.[5] C01B 25/26, 25/32, 25/34
U.S. Cl. 562—8 16 Claims

1. A layered divalent metal phosphate-type composition having the formula $M(HAO_4)_x(RAO_3)_y(Z)_z$ wherein M is a

divalent metal, A is a pentavalent atom, R is a substituent group other than H or OH, covalently bonded to A, Z is an



intercalated moiety, x+y=1, y is greater than 0, and z ranges from 0 to 2.

4,962,229

OLEFINIC DIPHOSPHONIC ACIDS, A PROCESS FOR THEIR PRODUCTION, THEIR USE AS THRESHOLDERS, AND COMPLEXING COMPOSITIONS CONTAINING THEM

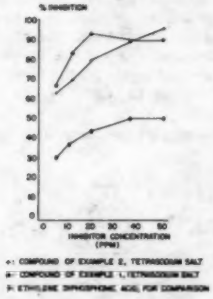
Helmut Blum, Duesseldorf, and Siglinde Hemmann, Meerbusch, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Division of Ser. No. 223,473, Jul. 22, 1988, Pat. No. 4,880,575. This application Jun. 30, 1989, Ser. No. 374,323

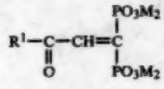
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 3724653

Int. Cl.[5] C07F 9/38

U.S. Cl. 562—21 **10 Claims**


% INHIBITION
INHIBITOR CONCENTRATION (PPM)
+: COMPOUND OF EXAMPLE 2, TETRASODIUM SALT
o: COMPOUND OF EXAMPLE 1, TETRASODIUM SALT
P: ETHYLENE DIPHOSPHONIC ACID, FOR COMPARISON

1. A 3-R^1-3-oxoprop-1-ene-1,1-diphosphonic acid corresponding to the formula



(III)

wherein R^1 represents

a tertiary alkyl group having the formula $—(R^2)C(R^3)(R^4)$, where R^2 and R^3 independently of one another represent a C_1–C_3 alkyl group, and R^4 represents a C_1–C_{10} alkyl group, or

an unsubstituted or methyl or ethyl substituted cycloalkyl group, or

an aryl or heteroaryl group which is unsubstituted or substituted by halogen, C_1–C_5 alkoxy, di-C_1–C_5-alkylamino, or C_1–C_5 alkyl; and each M group is H or the cation of a base.

4,962,230

PROCESS FOR PRODUCING OPTICALLY ACTIVE CARBOXYLIC ACID

Hidemasa Takaya; Tetsuo Ohta; Ryoji Noyori, all of Aichi; Noboru Sayo, Kanagawa; Hidenori Kumobayashi, Kanagawa, and Susumu Akutagawa, Kanagawa, all of Japan, assignors to Takasago International Corporation, Tokyo, Japan

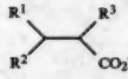
Filed Nov. 16, 1987, Ser. No. 121,247

Claims priority, application Japan, Nov. 14, 1986, 61-269589; Jul. 31, 1987, 62-192339

Int. Cl.[5] C07C 229/42

U.S. Cl. 562—433 **7 Claims**

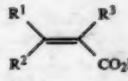
1. A process for producing an optically active carboxylic acid represented by formula (I):



(I)

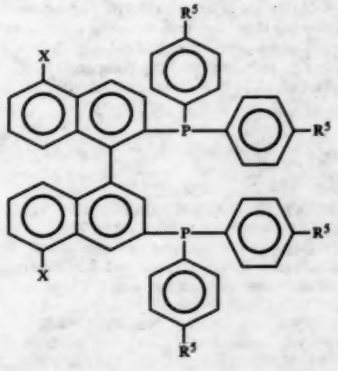
wherein R^1, R^2 and R^3 are each selected from the group consisting of a hydrogen atom, an alkyl group, an alkenyl group, a phenyl group, a substituted phenyl group, a naphthyl group and a substituted naphthyl, wherein said substituted phenyl and said substituted naphthyl are substituted with a member selected from the group consisting of a hydroxyl group, a methoxy group, an amino group, a dimethylamino group, a chlorine atom, and a bromine atom, provided that all of R^1, R^2 and R^3 do not simultaneously represent a hydrogen atom; and when R^1 and R^2 simultaneously represent a hydrogen atom, then R^3 is not a methyl group; and that when R^3 is a hydrogen atom, then R^1 and R^2 are each a group other than a hydrogen atom; which process comprises:

asymmetrically hydrogenating an α, -unsaturated carboxylic acid represented by formula (II):



(II)

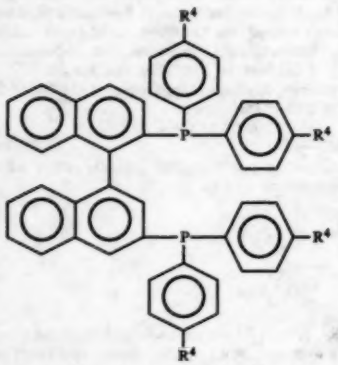
wherein R^1, R^2, and R^3 are the same as defined above, in the presence of a ruthenium-optically active phosphine complex represented by formula (V) or (VII), below, as a catalyst



(VI)

in which X represents a hydrogen atom, an amino group, an acetylamino group, or a sulfo group; R^5 represents a hydrogen atom or a lower alkyl group; R^6 and R^7 each represents an alkyl group, a halogenated lower alkyl group, a phenyl group, a phenyl group substituted with a lower alkyl group, an α-aminoalkyl group, or an α-aminophenylalkyl group, or R^6 and

R^7 are taken together to form an alkylene group; and q represents 1 or 2;



(IV)

in which R^4 is a hydrogen atom or a methyl group; Y is ClO_4, BF_4, or PF_6; when l is 0, then v is 1 and w is 2; and when l is 1, then v is 2 and W is 1.

4,962,231

PREPARATION OF D- OR L-ALANINE OR HIGH ENANTIOMERIC PURITY

Axel Paul, Mannheim; Peter Tonne, Neustadt; Eckhard Roske, Ludwigshafen, and Hardo Siegel, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 10, 1988, Ser. No. 205,342

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719872

Int. Cl.[5] C07C *227/08*

U.S. Cl. 562—575 **7 Claims**

1. A process for the preparation of D—or L—alanine of high enantiomeric purity which comprises: reacting an optically active chloropropionic acid of high enantiomeric purity with ammonia or an ammonia-donating compound in water or a water/alcohol mixture at from 50 to 110° C. wherein the total amount of ammonia or ammonia-donating compound used is not less than 2 moles per mole of said chloropropionic acid and said ammonia or ammonia-donating compound is added in an amount such that a pH of 6 to 9 is maintained.

4,962,232

CATALYST SYSTEM AND CATALYTIC ALKANE CARBONYLATION PROCESS

Serge Delavarenne, Saint Germain en Laye; Michel Fauconet, St. Avold; Michel Simon, Harnes, and Jean Sommer, Strasbourg, all of France, assignors to Societe Chimique des Charbonnages, S.A., Cedex, France

Filed Nov. 13, 1987, Ser. No. 120,482

Claims priority, application France, Nov. 14, 1986, 86 15841; Dec. 11, 1986, 86 17331; Feb. 19, 1987, 87 02140; Mar. 26, 1987, 87 04210

Int. Cl.[5] C07C *51/58*

U.S. Cl. 562—851 **15 Claims**

1. A superacidic catalyst system comprising hydrogen fluoride, antimony pentafluoride, and at least one compound selected from the group consisting of bromine, iodine, bromides, and iodides.

4,962,233

PROCESS FOR PREPARING RACEMIC DIHALOVINYLCYCLOPROPANE CARBOXYLIC ACID HALIDES

Koji Hagiya; Gohfu Suzukamo, both of Osaka; Masami Fukao, Shiga, and Hiroko Sakane, Osaka, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

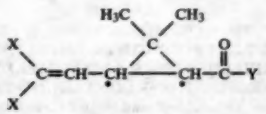
Filed May 9, 1989, Ser. No. 349,056

Claims priority, application Japan, May 19, 1988, 63-122843; May 26, 1988, 63-128627; Jul. 13, 1988, 63-17.652; Jul. 13, 1988, 63-175653; Aug. 9, 1988, 63-199156

Int. Cl.[5] C07C *61/40*

U.S. Cl. 562—866 **42 Claims**

1. A process for preparing racemic dihalovinylcyclopropane carboxylic acid halides which comprises allowing iodides selected from the group consisting of phosphorus iodides, silicon iodides and boron iodides to react with an optionally active 2,2-dimethyl-3-(2,2-dihalovinyl)-cyclopropane carboxylic acid halide of the formula:



wherein both X and Y are halogen atoms and the mark * indicates an asymmetric carbon atom.

4,962,234

ANTIOXIDANT FOR POLYESTER FLUIDS - ALPHA - METHYL - N PHENYLBENZENEMETHANAMINE

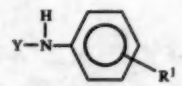
Baldev K. Bandlish, Middlebury; Frederick C. Loveless, Cheshire, and Walter Nudenberg, Newtown, all of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Continuation of Ser. No. 701,884, Mar. 11, 1985, which is a continuation of Ser. No. 198,085, Oct. 17, 1980, abandoned, which is a continuation of Ser. No. 43,996, May 31, 1979, abandoned. This application Jun. 1, 1988, Ser. No. 201,270

Int. Cl.[5] C07C *211/00*

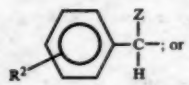
U.S. Cl. 564—384 **13 Claims**

1. A compound having the formula:

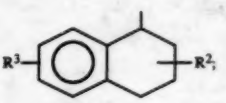


(I)

wherein Y is



(II)



(III)

wherein:

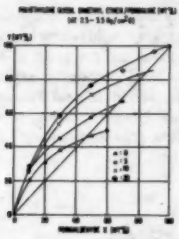
when Y is a moiety of formula (II), Z is C_1–C_3 alkyl; R^1 is hydrogen, C_1–C_{12} alkyl, C_1–C_{12} alkoxy, C_2–C_{18} carbalkoxy, halogen, or nitro; and R^2 is hydrogen, C_1–C_{12} alkyl, C_1–C_{12} alkoxy, C_2–C_{18} carbalkoxy, halogen or nitro; and

when Y is a moiety of formula (III), R_1 and R_3 are each independently hydrogen, C_1–C_{12} alkyl, C_1–C_{12} alkoxy, C_2–C_{18} carbalkoxy, halogen, or nitro; and R^2 is as defined above.

4,962,235
PROCESS FOR PRODUCING HIGH PURITY FORMALDEHYDE

Hirohisa Morishita; Junzo Masamoto, and Tadashige Hata, all of Okayama, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 5, 1989, Ser. No. 333,226
Claims priority, application Japan, Apr. 7, 1988, 63-84063
Int. Cl.[5] C07C *45/82*
U.S. Cl. 568—493 7 Claims



1. A proccss for producing formaldehyde having high purity which comprises:

(A) feeding crude formaldehyde containing water and methanol to the middle or lower part of a distillation column, and feeding a polyalkylene oxide compound which is inert to formaldehyde to the upper part of the column in an amount at least 10 times the total weight of the water and methanol contained in the crude formaldehyde;

(B) carrying out distillation at a temperature of from 80° to 200° C. and at a pressure of from atmospheric pressure to 5 kg/cm^2G and;

(C) recovering purified formaldehyde gas from the top of the column while withdrawing a solution containing the polyalkylene oxide compound, water and methanol from the bottom of the column, wherein said polyalkylene oxide compound is a polyalkylene glycol having ethylene oxide or methylene oxide as a constituting unit with at least 90% of the terminal hydroxyl groups thereof being blocked with terminal groups stable to both water and formaldehyde.

4,962,236
IODINE-CONTAINING COMPOUND, PREPARATION THEREOF AND BLOCK COPOLYMER COMPRISING THE SAME

Masayoshi Tatemoto; Yuji Yutani, and Koji Fujiwara, all of Osaka, Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Division of Ser. No. 136,916, Dec. 22, 1987, Pat. No. 4,861,836. This application May 1, 1989, Ser. No. 345,571
Claims priority, application Japan, Dec. 23, 1986, 61-310397; Dec. 23, 1986, 61-310398
Int. Cl.[5] C07C *43/16;* C10M *105/54*
U.S. Cl. 568—615 6 Claims

1. An iodine-containing compound consisting of at least two repeating units selected from the formulae:

$-(CH_2CF_2CF_2O)_a-$

$-(CHClCF_2CF_2O)_b-$

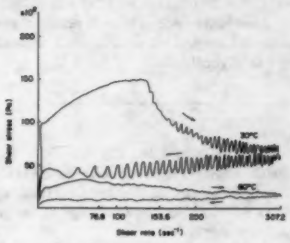
$-(CCl_2CF_2CF_2O)_c-$

$-(CHFCF_2CF_2O)_d-$

$-(CFClCF_2CF_2O)_e-$

$-(CF_2CF_2CF_2O)_f-$

wherein a, b, c, d, e and f are each 0 or a positive integer and satisfy the following equations:



$2 \leqq a+b+c+d+e+f \leqq 200$ and

$1 \leqq a+c+d+f$

and an iodine atom at at least one end of a molecule.

4,962,237
CATALYTIC PROCESS FOR THE PREPARATION OF POLYOLS

David E. Laycock, Sarnia, Canada, assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 808,803, Dec. 13, 1985, abandoned. This application Jan. 2, 1990, Ser. No. 459,918
Int. Cl.[5] C07C *41/03*
U.S. Cl. 568—618 23 Claims

1. A process for producing reaction products having essentially no terminal unsaturation comprising contacting an active hydrogen initiator with an epoxide in the presence of a catalytic amount of a particulate solid formed by calcining a catalyst precursor, said precursor having an elemental analysis comprising:

(a) a first metal having a plus three oxidation state, said first metal comprising aluminum;

(b) at least one secondary metal which has a plus two oxidation state;

(c) oxygen, bonded to aluminum and the secondary metal or metals; and

(d) at least one Lowry-Bronsted anionic base,

components a, b, c, and d being present in proportions such that the precursor has layered anionic structure prior to calcining, said process being conducted under conditions sufficient to produce a polyol.

4,962,238
REMOVAL OF GLYCOLS FROM A POLYALKYLENE GLYCOL DIALKYL ETHER SOLUTION

Ralph G. Wolfe, East Brunswick; Dennis P. Maloney, Morristown, both of N.J.; Robert E. Steele, Bunker Hill Village, Tex.; Constantine Tsonopoulos, Morristown, N.J., and Eugene R. Thomas, Houston, Tex., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Oct. 4, 1989, Ser. No. 417,112
Int. Cl.[5] C07L *41/38*
U.S. Cl. 568—621 26 Claims

1. A process for the purification of a solution comprising a polyalkylene glycol dialkyl ether or mixtures thereof which comprises:

(1) contacting in an extraction zone a glycol contaminated polyalkylene glycol dialkyl ether solution with a solvent system comprising an organic solvent and an aqueous solvent;

(2) dividing the contents of the extraction zone into two phases, a first phase relatively rich in both said organic solvent and said polyalkylene glycol dialkyl ether solution and a second phase relatively rich in said aqueous solvent and said glycol; and

(3) separating said first phase into two streams: a first stream relatively rich in organic solvent for recycle to said extraction zone and a second stream relatively rich in polyalkylene glycol dialkyl ether and, with respect to the feed, depleted in glycols.

4,962,239

PROCESS FOR PREPARING ETHERS

Weldon K. Bell, Pennington; Werner O. Haag, Lawrenceville, and David O. Marler, Deptford, all of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Continuation-in-part of Ser. No. 254,524, Oct. 6, 1988, which is a continuation-in-part of Ser. No. 98,176, Sep. 18, 1987, abandoned, which is a continuation-in-part of Ser. No. 890,268, Jul. 29, 1986, abandoned. This application Dec. 26, 1989, Ser. No. 456,702

Int. Cl.[5] C07C *41/05*

U.S. Cl. 568—697 25 Claims

1. A process for manufacturing an ether or mixture of ethers which comprises reacting at least one olefin with at least one alcohol under etherification reaction conditions to provide at least one ether employing an etherification catalyst composition comprising an acidic synthetic porous crystalline material characterized by an X-ray diffraction pattern including values substantially as set forth in Table A of the specification.

4,962,240

METHOD FOR SYMMETRICALLY DIMERIZING PHENOLS AND PROCESS FOR PRODUCING BIPHENOLS

Taku Kitamura; Noriko Kurokawa, both of Ichikawa, and Katsuji Takahashi, Chiba, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

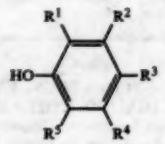
Filed Mar. 9, 1989, Ser. No. 321,067

Claims priority, application Japan, Mar. 11, 1988, 63-56013; Jun. 24, 1988, 63-154651

Int. Cl.[5] C07C *39/14, 37/11*

U.S. Cl. 568—730 20 Claims

1. A method for symmetrically dimerizing phenols represented by the formula



Wherein R^1, R^2, R^3, R^4 and R^5, which may be the same or different, each denotes a hydrogen atom, a hydrocarbon group having 1 to 8 carbon atoms, an alkoxy group or an allyloxy group, or the adjacent R groups may form a cyclic structure by a bonding group selected from the group consisting of a polymethylene group and a dioxymethylene group, provided at least one of the substituents in the ortho- or para-position is hydrogen, said method comprising

oxidizing said phenols in molten state in the liquid phase using a metallic soap of a transition metal as a catalyst and an oxygen-containing gas as an oxidizing agent to conduct dimerization.

4,962,241

PROCESS FOR PRODUCING DIHYDROXYNAPHTHALENES

Masaaki Yasuda, and Hisayu Miki, both of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

PCT No. PCT/JP88/00555, § 371 Date Feb. 3, 1989, § 102(e) Date Feb. 3, 1989, PCT Pub. No. WO88/09781, PCT Pub. Date Dec. 15, 1988

PCT Filed Jun. 9, 1988, Ser. No. 309,671

Claims priority, application Japan, Jun. 12, 1987, 62-146445

Int. Cl.[5] C07C *39/38*

U.S. Cl. 568—737 17 Claims

1. A process for producing a dihydroxynaphthalene which comprises hydrolyzing a diacyloxynaphthalene in a water-containing solvent comprising water and a solvent selected from the group consisiting of alcohols, carboxylic acids, ketones, ethers and nitriles in the presence of an acid catalyst selected from the group consisting of inorganic acids, strong acidic ion-exchange resins, solid acids, organic acids and Lewis acids.

4,962,242

PROCESS FOR PRODUCING OPTICALLY ACTIVE ALCOHOLS

Nobuo Yamada, Kanagawa; Toshiyuki Takezawa, Saitama; Noboru Sayo; Misao Yagi, both of Kanagawa; Hidenori Kumobayashi; Susumu Akutagawa, both of Kanagawa; Hidemasa Takaya; Shinichi Inoue, both of Aichi, and Ryoji Noyori, Aichi, all of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

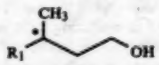
Filed Jun. 25, 1987, Ser. No. 66,164

Claims priority, application Japan, Aug. 27, 1986, 61-200859; Mar. 25, 1987, 62-69056

Int. Cl.[5] C07C *29/17, 31/125, 31/135, 33/025*

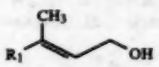
U.S. Cl. 568—822 5 Claims

1. A process for producing an optically active alcohol represented by formula (I):



(I)

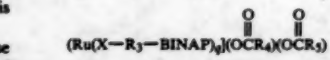
wherein R_1 is an alkyl group having from 2 to 11 carbon atoms, an alkenyl group having from 3 to 11 carbon atoms, an alkadienyl group having from 6 to 11 carbon atoms, a cyclohexyl group, a cyclohexylmethyl group, or a cyclohexylethyl group, provided that the olefin in the alkenyl group or alkadienyl group is not conjugated to the olefin at the 2-position thereof; and * means an asymmetric carbon atom, which process comprises subjecting an olefinic alcohol represented by formula (II):



(II)

wherein R_1 is the same as defined above,

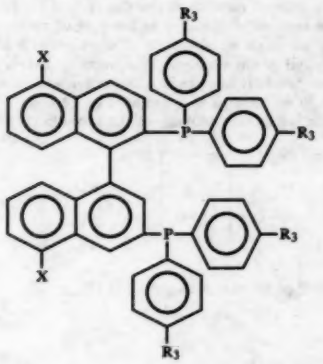
to asymmetric hydrogenation in the presence of, as a catalyst, a ruthenium-optically active phosphine complex, said ruthenium-optically active phosphine complex being one represented by formula (v):



(V)

wherein S-R-hd 3-BINAP signifies a tertiary phosphine of formula (VI):

(VI)



wherein X represents a hydrogen atom, an amino group, an acetylamino group, or a sulfo group; R_3 represents a hydrogen atom or a lower alkyl group; R_4 and R_5 each represents an alkyl group, a halogenated lower alkyl group, a phenyl group, a phenyl group substituted with a lower alkyl group, an α-aminoalkyl group, or an α-aminophenylalkyl group, or R_4 and R_5 are taken together to form an alkylene group; and q represents 1 or 2.

4,962,243

PREPARATION OF OCTADIENOLS

Michael Roeper, Wachenheim; Werner Bertleff, Viernheim, and Dieter Koeffer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 24, 1989, Ser. No. 315,312

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1988, 3806305

Int. Cl.[5] C07C *29/00, 33/02*

U.S. Cl. 568—909.5 **19 Claims**

1. A process for preparing an octadienol, comprising: telomerizing 1,3-butadiene with water in the presence of carbon dioxide, a non-coordinating acid and a catalyst system comprised of a palladium compound and a tertiary phosphorus compound, the ratio of acid to palladium in said palladium compound ranging from 0.1:150 equivalent % per mole of palladium and the amount of palladium compound employed relative to butadiene reactant ranging from 10^{-5} to 0.1 mole of palladium per mole of butadiene.

4,962,244

PROCESS FOR PRODUCING 1,1-DICHLORO-1-FLUOROETHANE AND/OR 1-CHLORO-1,1-DIFLUOROETHANE FREE OF VINYLIDENE CHLORIDE

Maher Y. Elsheikh, Tredyffrin, Pa., assignor to Atochem North America, Inc., Philadelphia, Pa.

Filed Apr. 3, 1989, Ser. No. 332,690

Int. Cl.[5] C07C *17/00*

U.S. Cl. 570—165 **11 Claims**

1. A process for forming 1,1-dichloro-1-fluoroethane and/or 1-chloro-1,1-difluoroethane substantially free of vinylidene chloride comprising treating 1,1,1-trichloroethane with anhydrous hydrogen fluoride in the liquid phase in a molar ratio of hydrogen fluoride to 1,1,1-trichloroethane of from about 10:1 to about 1:1, at a temperature of from about 22° C. to about 200° C., in the presence of from about 0.1 mole % to about 10 mole % of a boron containing catalyst, based upon the combined amount of the catalyst and hydrogen fluoride, said catalyst consisting essentially of boron trifluoride or a compound which is converted to boron trifluoride under the reaction conditions of said process.

4,962,245

PROCESS FOR PREPARING HALOGENATED BENZENE DERIVATIVES

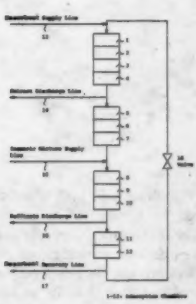
Takashi Kanai; Michio Kimura, and Yoshio Noguchi, all of Aichi, Japan, assignors to Toray Industries, Japan

Filed Feb. 21, 1989, Ser. No. 313,074

Claims priority, application Japan, Feb. 26, 1988, 63-44934

Int. Cl.[5] C07C *17/37*

U.S. Cl. 570—211 **13 Claims**



1. A process for separating an isomer of a ring-halogenated benzene derivative having a mono benzene ring from a mixture of the isomers of a ring-halogenated benzene derivative containing hydrogen halide and obtained through isomerization comprising subjecting said mixture to (a) a step selected from distilling and stripping to remove the hydrogen halide therefrom, and then (b) a step of contacting with a zeolite adsorbent for selectively separating the desired isomer of the ring-halogenated benzene derivative.

4,962,246

PROCESS FOR THE PREPARATION OF BENZOTRIFLUORIDES WHICH ARE SUBSTITUTED BY FLUORINE AND OPTIONALLY IN ADDITION BY CHLORINE, AND NEW BENZOTRIFLUORIDES

Albrecht Marhold, Leverkusen, and Rudolf Braden, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 220,038, Jul. 15, 1988, Pat. No. 4,885,415. This application Jul. 7, 1989, Ser. No. 376,725

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1987, 3725659

Int. Cl.[5] C07C *21/24, 17/24*

U.S. Cl. 570—127 **2 Claims**

1. 2,4,6-Trifluoro-3-chlorobenzotrifluoride.
2. 2,3,6-Trifluorobenzotrifluoride.

4,962,247

PROCESS FOR THE PRODUCTION OF HALOGENATED HYDROCARBONS

Michael T. Holbrook, Baton Rouge, La., and Timothy Juhlke, Round Rock, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 10, 1989, Ser. No. 295,864

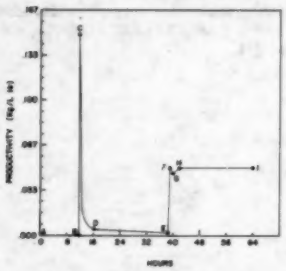
Int. Cl.[5] C07C *17/00, 19/02*

U.S. Cl. 570—240 **18 Claims**

1. A process for preparing halogenated hydrocarbons of the formula $C_nH_{2n+2-z}X_z$ wherein n is a whole positive integer less than or equal to four, z is a whole positive integer less than or equal to ten, $2n+2-z$ is a whole integer less than or equal to zero, and X is a halogen radical, which process comprises:

(a) maintaining a reaction zone at a temperature within the range of from about 180° C. to about 400° C. and at a pressure within the range of from about 10 atmospheres to about 300 atmospheres, said reaction zone containing a catalytic bed comprising an acidic inorganic oxide material and a catalyst selected from the group consisting of a Pt, Pd, Ir, Rh metal and mixtures thereof;

(b) continuously flowing a feed mixture comprising CO, H_2 and, as a halogen source, molecular halogen or hydrogen



halide into said zone and into reactive contact with said catalytic bed;

(c) continuously removing from said reaction zone a resultant reaction product, which product contains said halogenated hydrocarbons, the removal being effected so as to provide a reaction time within the range of from about 1 second to about 20 seconds; and

(d) maintaining the amount of said halogen source in said feed mixture so that the molar ratio of H_2:CO:halogen source is within the range of 1-20:1:0.01-0.10.

4,962,248

1-OLEFIN STEREOBLOCK POLYMER WAX, AND A PROCESS FOR THE PREPARATION THEREOF

Andreas Winter, Kelkheim; Martin Antberg, Hofheim am Taunus, and Jürgen Rohrmann, Neufahrn, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 19, 1988, Ser. No. 286,451

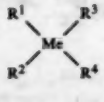
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1987, 3743320

Int. Cl.[5] C08F 4/42

U.S. Cl. 585—12 **5 Claims**

1. A stereoblock polymer wax comprising units derived from a 1-olefin of the formula $RCH{=}CH_2$ in which R denotes an alkyl radical having 1 to 28 carbon atoms, having alternating isotactic sequences with an opposed configuration and having a length of 3 or more monomer units in the molecular chain, having saturated chain ends, having a molecular weight distribution M_w/M_n of from 1.8 to 3.0 and having a viscosity number of from 2 to 60 cm^3/g.

2. A process for the preparation of a 1-olefin stereoblock polymer wax as claimed in claim 1, by polymerizing a 1-olefin of the formula $R{-}CH{=}CH_2$ in which R is an alkyl radical having 1 to 28 carbon atoms, in one or more steps at a temperature of from −50° to 200° C., at a pressure of from 0.5 to 120 bar, in solution, in suspension or in the gas phase, in the presence of a catalyst comprising a transition metal compound and an aluminoxane, which comprises carrying out the polymerization in the presence of a catalyst whose transition metal compound is a metallocene compound of the formula I

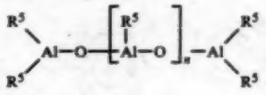


(I)

in which

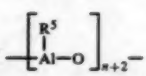
R^1 and R^2 are identical or different and denote a halogen atom, C_1–C_{10}-alkyl, C_6–C_{10}-aryl, C_2–C_{10}alkenyl, C_7–C_{40}-arylalkyl, C_7–C_{40}-alkylaryl or C_8–C_{40}alkenylaryl,

R^3 and R^4 are identical or different and denote a substituted cyclopentadienyl radical, where this radical contains one or more centers of chirality and has been produced by reacting an alkali metal cyclopentadienide with a chiral alcohol, and Me is titanium, zirconium or hafnium, and has been pre-activiated before the polymerization for 5 minutes to 60 minutes at a temperature of from −78° to 100° C. using an aluminoxane of the formula II



(II)

for the linear type or one of the formula III



(III)

for the cyclic type, where, in the formulae II and III,

R^5 denotes methyl, ethyl or isobutyl and n is an integer from 5 to 40, and where the activator is likewise an aluminoxane of the formula II or III, and hydrogen is present in the 1-olefin:H_2 molar ratio of from 3 to 3000.

4,962,249

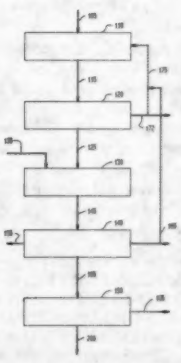
HIGH VI LUBRICANTS FROM LOWER ALKENE OLIGOMERS

Catherine S. H. Chen, Berkley Heights, and Margaret M. S. Wu, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 210,436, Jun. 23, 1988. This application Feb. 15, 1990, Ser. No. 480,709

Int. Cl.[5] C07C 2/08, 2/10, 2/12

U.S. Cl. 585—329 **20 Claims**



1. A process for the production of hydrocarbon lubricant fluids having high viscosity index, comprising;

contacting a mixture comprising slightly branched and linear higher alpha olefins under oligomerization conditions with a reduced valence state Group VIB metal catalyst on porous support; wherein said higher alpha olefins comprise the olefin metathesis reaction product of slightly branched higher olefinic hydrocarbons with lower olefinic hydrocarbons in contact with metathesis catalyst, and said higher olefinic hydrocarbons comprise the oligomerization product of lower alkene oligomerized in contact with surface deactivated, acidic, medium pore, shape selective metallosilicate catalyst under oligomerization conditions; and

separating the higher alpha olefins oligomerization reaction

product to provide said lubricant having a branch index above 0.20, a viscosity index greater than 130 and a pour point less than −15° C.

4,962,250

PROCESS FOR THE CONVERSION OF PARAFFINS TO OLEFINS AND/OR AROMATICS AND NON-ACIDIC ZEOLITE CATALYST THEREFOR

Ralph M. Dessau, Edison, and Randall D. Partridge, West Trenton, both of N.J., assignors to Mobile Oil Corp., New York, N.Y.

Filed Jan. 24, 1990, Ser. No. 469,650
Int. Cl.[5] C07C *2/52, 12/46, 5/333*
U.S. Cl. 585—417 23 Claims

1. A process for producing an olefin and/or aromatic compound which comprises contacting under conversion conditions a feedstock containing a substantial amount of at least one C_2–C_{12} aliphatic hydrocarbon with a conversion catalyst comprising a Group VIII metal species-containing, essentially non-acidic synthetic porous crystalline material characterized by an X-ray diffraction pattern including values substantially as set forth in Table I of the specification.

4,962,251

PROCESS FOR PRODUCTION OF AROMATIC HYDROCARBONS

Takashi Yamamoto; Toshikazu Yoneda; Hisashi Katsuno; Takashi Murakawa, and Nobuyuki Takahashi, all of Sodegaura, Japan, assignors to Research Association for Utilization of Light Oil, Tokyo, Japan

Continuation-in-part of Ser. No. 214,522, Jul. 1, 1988, abandoned. This application Dec. 28, 1989, Ser. No. 462,298
Claims priority, application Japan, Jul. 30, 1987, 62-188850; Dec. 19, 1987, 62-322478
Int. Cl.[5] C07C *2/52*
U.S. Cl. 585—419 17 Claims

1. An improved catalytic process for producing aromatic hydrocarbons having increased catalyst life comprising contacting a naphtha fraction with a catalyst comprising a large pore zeolite containing at least one Group VIII metal of the Periodic Table,

the improvement comprising contacting said catalyst with a naphtha fraction containing cyclopentane and methylpentane, at least one of said (i) cyclopentane being in an amount not more than 1% by weight and (ii) methylpentane being in an amount not more than 10% by weight.

4,962,252

PROCESS FOR THE PRODUCTION OF ALKENYL-SUBSTITUTED BENZENE DERIVATIVES

Steven R. Wade, Surrey, England, assignor to The British Petroleum Company p.l.c., London, England

Continuation of Ser. No. 300,487, Jan. 23, 1989, abandoned. This application Jul. 25, 1989, Ser. No. 384,916
Claims priority, application United Kingdom, Feb. 6, 1988, 8802731
Int. Cl.[5] C07C *15/46*
U.S. Cl. 585—438 7 Claims

1. A process for the production of an alkenyl-substituted benzene derivative by oxidatively coupling at elevated temperature a benzene having at least one activated saturated hydrocarbyl substituent in vapour form with a gaseous paraffinic hydrocarbon in the presence of a gaseous oxidant and a catalyst therefor wherein the catalyst is selected from (a) a lithium doped magnesium oxide promoted with sodium carbonate or (b) trimanganese tetroxide incorporating at least one of the elements aluminum, tin, titanium, tungsten, tantalum, silicon, germanium, lead, phosphorus, arsenic, antimony, boron, gallium and indium promoted with at least one alkali metal halide.

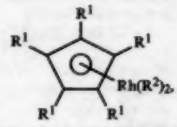
4,962,253

VINYLATION OF AROMATICS CATALYZED BY CYCLOPENTADIENYL, INDENYL, OR FLUORENYL RHODIUM COMPLEXES, AND NOVEL INDENYL AND FLUORENYL RHODIUM COMPLEXES

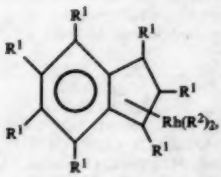
Robert A. Dubois, Houston, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 21, 1989, Ser. No. 397,150
Int. Cl.[5] C07C *15/46, 2/64*
U.S. Cl. 585—438 13 Claims

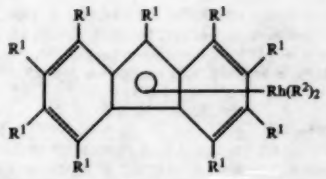
1. A process for the preparation of vinyl aromatic compounds which comprises contacting an aromatic compound and an olefin in the presence of a catalytic amount of a cyclopentadienyl rhodium complex of the following formula:



an indenyl rhodium complex of the following formula:



or a fluorenyl rhodium complex of the following formula:



wherein each R^1 is separately a hydrogen, or a primary or secondary $C_{1\text{-}20}$ alkyl or alkylsilyl, halo, cyano, carboalkyl, carboaryl, carboaryloxy, carboalkoxy, alkylthio, or arylthio moiety and R^2 is separately in each occurrence a $C_{1\text{-}20}$ alkene, carbonyl phosphino, phosphito, arsino, stibino, or isonitrilo moiety; under reaction conditions sufficient to form the corresponding vinyl aromatic compound.

4,962,254

PROCESS FOR PREPARING ALKYL-SUBSTITUTED AROMATIC HYDROCARBONS

Masami Fukao, Shiga; Takuo Hibi, Toyonaka; Kiyoshi Ikimi, Otokuni, and Gohfu Suzukamo, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 9, 1989, Ser. No. 391,242
Claims priority, application Japan, Aug. 12, 1988, 63-202468; Aug. 12, 1988, 63-202469
Int. Cl.[5] C07C *15/067, 2/68*
U.S. Cl. 585—452 28 Claims

1. A process for preparing an alkyl-substituted hydrocarbon comprising alkylating an alkyl aromatic hydrocarbon having at least one hydrogen atom at an alpha-position in a side chain with an olefin in the presence of a solid base which is obtainable by reacting an alumina, an alkali metal hydroxide and an alkali metal hydride or an alumina containing at least 1.3 % by

weight of water and an alkali metal hydride in an inert gas atmosphere at a temperature of 200° to 800° C. as a catalyst.

4,962,255

CATALYSTS AND PROCESS FOR THE PRODUCTION OF HYDROCARBONS AND SUBSTITUTION OF HYDROCARBONS

Dan Fraenkel; Moshe Levy; Baruch Ittah, all of Rehovot, Israel, and Margaret Cherniavsky, late of Rehovot, Israel (William Cherniavsky, executor), assignors to Yeda Research & Development Company Limited, Rehovot, Israel

Continuation of Ser. No. 783,011, Oct. 2, 1985, abandoned. This application Mar. 6, 1989, Ser. No. 319,865

Claims priority, application Israel, Oct. 2, 1984, 73146

The portion of the term of this patent subsequent to Jun. 3, 2003, has been disclaimed.

Int. Cl.[5] C07C 2/66

U.S. Cl. 585—467 7 Claims

1. A method of preferred beta-position alkylation of a substrate comprising naphthalene or a derivative thereof, which comprises reacting the substrate with a C_1–C_3-alkanol or C_2–C_3-olefin alkylating agent while contacting the substrate and alkylating agent with a catalyst selected from the group consisting of a crystallized borosilicate glass zeolite alkylation catalyst and a crystalline silica-alumina catalyst at 400°–500°, said catalyst being at least 86% beta selective with respect to the alkylation of naphthalene by said alkylating agent at 400°–500° C.

4,962,256

PROCESS FOR PREPARING LONG CHAIN ALKYL AROMATIC COMPOUNDS

Quang N. Le, Cherry Hill; David O. Marler, Deptford; John P. McWilliams, Woodbury, all of N.J.; Mae K. Rubin, Bala Cynwyd, Pa.; Joosup Shim, Wenonah, and Stephen S. Wong, Medford, both of N.J., assignors to Mobil Oil Corp., Fairfax, Va.

Continuation-in-part of Ser. No. 254,524, Oct. 6, 1988, which is a continuation-in-part of Ser. No. 98,176, Sep. 18, 1987, abandoned, which is a continuation-in-part of Ser. No. 890,268, Jul. 29, 1986, abandoned. This application Jan. 25, 1990, Ser. No. 469,999

Int. Cl.[5] C07C 2/66

U.S. Cl. 585—467 29 Claims

1. A process for preparing long chain alkyl aromatic compounds which comprises contacting at least one alkylatable aromatic compound with at least one alkylating agent possessing an alkylating aliphatic group having at least six carbon atoms under alkylation reaction conditions and in the presence of an alkylation catalyst to provide an alkylated aromatic product possessing at least one alkyl group derived from said alkylating agent, said catalyst comprising a synthetic porous crystalline material characterized by an X-ray diffraction pattern including values substantially as set forth in Table A of the specification.

4,962,257

PROCESS FOR THE CATALYTIC DISPROPORTIONATION OF TOLUENE

Robert P. L. Absil, W. Deptford; Scott Han, Lawrenceville; David O. Marler, Deptford, and David S. Shihabi, Pennington, all of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Continuation-in-part of Ser. No. 254,524, Oct. 6, 1988, which is a continuation-in-part of Ser. No. 98,176, Sep. 18, 1987, abandoned, which is a continuation-in-part of Ser. No. 890,268, Jul. 29, 1986, abandoned. This application Jan. 24, 1990, Ser. No. 469,633

Int. Cl.[5] C07C 5/52

U.S. Cl. 585—475 17 Claims

1. A process for the disproportionation of toluene which comprises contacting toluene under disproportionation conditions with a conversion catalyst comprising a zeolite having an X-ray diffraction pattern including the lines listed in Table A of the specification.

4,962,258

LIQUID-PHASE XYLENE ISOMERIZATION

Jeffrey A. Amelse, Batavia; John A. Donohue, Elmhurst; Nancy A. Kutz, Wheaton; Judith B. Melville, Downers Grove, and Brian L. Slusar, Winfield, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Dec. 15, 1988, Ser. No. 285,105

Int. Cl.[5] C07C 5/22

U.S. Cl. 585—480 6 Claims

1. In a process to catalytically isomerize in the liquid phase a stream containing a major amount of one or more xylenes and a minor amount of ethylbenzene to a product rich in paraxylene, the improvement comprising isomerizing said stream under isomerization conditions over a catalyst composition which contains about 10 to about 80 weight percent, based upon the total weight of said catalyst composition, of a gallium-containing, crystalline silicate molecular sieve incorporated into about 20 to about 90 weight percent, based upon the total weight of said catalyst composition, of a n amorphous silica matrix, said sieve containing about 0.5 to about eight weight percent gallium, calculated as the metal, substantially all of said gallium occupying molecular sieve lattice positions or intimately associated with the crystal lattice of said crystalline silicate molecular sieve.

4,962,259

CATALYST FOR ISOMERIZING ALKYLAROMATICS

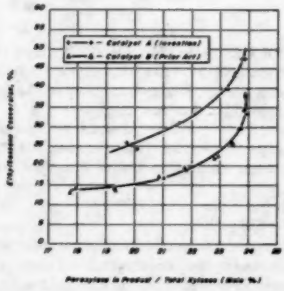
Johann W. A. Sachtler, Des Plaines; Randy J. Lawson, Palatine, and Susan L. Lambert, Rolling Meadows, all of Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 281,424, Dec. 8, 1988, Pat. No. 4,886,927, which is a division of Ser. No. 109,019, Oct. 16, 1987, abandoned. This application Dec. 7, 1989, Ser. No. 447,274

The portion of the term of this patent subsequent to Dec. 12, 2006, has been disclaimed.

Int. Cl.[5] C07C 5/22

U.S. Cl. 585—480 2 Claims



1. A process for the isomerization of a non-equilibrium feed mixture of xylenes containing ethylbenzene comprising contacting the feed mixture in the presence of hydrogen at isomerization process conditions with a catalyst comprising at least one Group VIII metal component and a gallium-substituted pentasil zeolite having an x-ray diffraction pattern characteristic of ZSM-12.

4,962,260

PREPARATION OF A DIMETHYLNAPHTHALENE

David Sikkenga, Wheaton; Ian C. Zaenger, Glen Ellyn, and Gregory S. Williams, Naperville, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 316,305, Feb. 27, 1989, abandoned, which is a continuation-in-part of Ser. No. 211,231, Jun. 24, 1988, abandoned. This application Oct. 23, 1989, Ser. No. 425,465

Int. Cl.[5] C07C 5/22

U.S. Cl. 585—481 15 Claims

1. A method for isomerizing at least 20 weight percent of the total of at least one dimethylnaphthalene isomer to form at least one other dimethylnaphthalene isomer in the same triad of dimethylnaphthalene isomers to which the isomer being isomerized belongs comprising: contacting each aforesaid dimethylnaphthalene isomer to be isomerized in liquid form with a solid isomerization catalyst comprising either beta zeolite or an acidic ultrastable Type-Y crystalline zeolite having a silica-to-alumina molar ratio of from about 4:1 to about 10:1, and having pore windows provided by twelve-membered rings containing oxygen and a unit cell size of from about 24.2 to about 24.7 angstroms and at a temperature in the range of from about at least 200° C. to about 400° C. at a pressure that is sufficiently high to maintain the isomerization feedstock substantially in the liquid phase.

4,962,261

PROCESS FOR UPGRADING METHANE TO HIGHER CARBON NUMBER HYDROCARBONS

Hayim Abrevaya, Wilmette, and Tamotsu Imai, Mount Prospect, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Jun. 20, 1988, Ser. No. 208,910

Int. Cl.[5] C07C 2/00, 5/00

U.S. Cl. 585—500 9 Claims

1. A process of converting methane to a hydrocarbon having two or more carbon atoms per molecule, which process comprises the steps:

(a) contacting methane and oxygen with a catalyst consisting essentially of oxides of boron, tin and zinc and optionally potassium or a compound thereof in a reaction zone maintained at conversion conditions, and

(b) recovering a hydrocarbon having two or more carbon atoms per molecule from an effluent stream of the reaction zone.

4,962,262

1-OLEFIN POLYMER WAX, AND A PROCESS FOR THE PREPARATION THEREOF

Andreas Winter, Kelkheim; Martin Antberg, Hofheim am Taunus, and Jürgen Rohrmann, Neufahrn, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

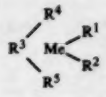
Filed Dec. 19, 1988, Ser. No. 286,743

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1987, 3743321

Int. Cl.[5] C10L 1/16; C07C 2/24, 2/02

U.S. Cl. 585—512 14 Claims

1. A process for the preparation of a 1-olefin polymer wax comprising units derived from a 1-olefin of the formula $RCH{=}CH_2$ in which R denotes an alkyl radical having 1 to 28 carbon atoms, having a molecular weight M_w of from 1,000 to 25,000, a molecular weight distribution M_2/M_n of from 1.8 to 4.0, a viscosity number of from 2 to 60 cm^3/g and a melting range of from 120 to 160° C., a melt enthalpy H of greater than 80 J/g, a drip point range of from 120 to 160° C. and a melt viscosity of from 100 to 20,000 mPa.s at 170° C., by polymerization of a 1-olefin of the formula $R{-}CH{=}CH_2$ in which R is an alkyl group having 1 to 28 carbon atoms, or copolymerization of this olefin with ethylene at a temperature of from −60 to 200° C., at a pressure of 0.5 to 120 bar, in solution, in suspension or in the gas phase, in the presence of a catalyst comprising a transition metal compound and an activator, a metallocene being the transition metal compound and an aluminoxane being the activator, which process comprises: carrying out the polymerization in the presence of a catalyst whose transition metal component is a metallocene of the formula (I)



(I)

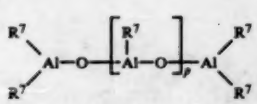
in which

Me is a metal from group IVb or Vb of the Periodic Table of the Elements,

R^1 and R^2 are identical or different and denote a C_1–C_{10} alkyl group, a C_6–C_{10}-aryl group, a C_{2-C10}-alkenyl group, a C_7–C_{40}-aralkyl group, a C_8–C_4—aryl-alkenyl group or a halogen atom, R^3 is a linear C_1–C_4–or a cyclic C_4–C_6–hydrocarbon radical which optionally contains at least one heteroatom in the chain as a bridging unit;

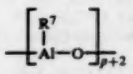
R^4 and R^5 are identical or different and denote a mononuclear or polynuclear hydrocarbon radical which is capable of forming a sandwich structure together with the central atom;

5 minutes to 60 minutes before the polymerization, pre-activating said metallocene at a temperature of from −78 to 100° C. using an aluminoxane of the formula (II)



(II)

for the linear type and/or of the formula (III)



(III)

for the cyclic type, where, in the formulae II and III, R^7 denotes a C_1–C_6-alkyl group and p is an integer from 5 to 40, and where the activator is likewise an aluminoxane of the formula II or III; and, during the polymerization, adding hydrogen in the 1-olefin:H_2 molar ratio from 3 to 3,000.

4,962,263

DISPROPORTIONATION OF OLEFINS

David M. Hamilton, Jr., and Richard A. Kemp, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 20, 1988, Ser. No. 196,571

The portion of the term of this patent subsequent to Jun. 28, 2005, has been disclaimed.

Int. Cl.[5] C07C 6/06

U.S. Cl. 585—646 48 Claims

1. A process for the disproportionation of olefinic hydrocarbons having carbon numbers ranging from C_2 to about C_{100} which comprises contacting said olefinic hydrocarbons at disproportionation conditions with a catalyst prepared by a process which comprises:

(a) preparing an alumina hydrogel having a sufficient water content to provide a hydrogel which is thixotropic, (b) mixing said alumina hydrogel with cobalt, a heavy metal selected from the group consisting of molybdenum, tungsten and mixtures thereof, and a phosphorus-containing compound in an amount of from about 0.2 to about 4.5 moles of phosphorus per mole of heavy metal at a pH in the range between about 4.0 and about 10.0 and a temperature in the range between about 25° C. and about 100° C.

until adsorption of the cobalt, heavy metal and phosphorus-containing compound onto the gel is sufficient to yield a final catalyst having from about 0.1% by weight to about 5% by weight cobalt from about 8% by weight to about 32% by weight heavy metal, and from about 0.5% by weight to about 6% by weight phosphorus, (c) extruding the product of step (b), and (d) calcining the product of step (c) at a temperature in the range of from about 500° C. to about 675° C.

4,962,264

METHODS FOR RETARDING COKE FORMATION DURING PYROLYTIC HYDROCARBON PROCESSING

David R. Forester, Conroe, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Oct. 23, 1989, Ser. No. 425,622

Int. Cl.[5] C07C *4/02*

U.S. Cl. 585—648 **21 Claims**

1. A method of inhibiting the formation and deposition of pyrolytic coke on the heated metal surfaces of the structural and associated parts of a pyrolysis furnace which is being used to crack a petroleum feedstock to produce lower and/or olefinic hydrocarbon fractions, which method comprises adding to the feedstock a coke inhibiting amount of a rare earth element or rare earth containing compound.

4,962,265

PROCESS AND CATALYST FOR THE CATALYTIC DEHYDROGENATION OF HYDROCARBONS

Georges E. M. J. De Clippeleir, Sint-Pieters-Leeuw, Belgium; Elizabeth B. Ofstad, Jar, and Steinar Kvisle, Oslo, both of Norway, assignors to Labofina, S.A., Brussels, Belgium

Filed Feb. 13, 1989, Ser. No. 310,261

Claims priority, application Belgium, Feb. 11, 1988, 8800157; Feb. 11, 1988, 8800158

Int. Cl.[5] C07C *5/333*

U.S. Cl. 585—660 **8 Claims**

1. A process for the catalytic dehydrogenation of paraffinic hydrocarbons having from 3 to 6 carbon atoms, in the presence of a catalyst comprising an alumina support containing at least one metal from the platinum group together with a co-catalyst and a promoter comprising the step of passing the feed to be dehydrogenated onto a catalyst containing from 0.1 to 2% by weight of at least one metal from the platinum group, from 0.1 to 2% by weight of at least one metal from the tin group as co-catalyst and from 0.5 to 5% by weight of at least one alkali or alkaline-earth metal as promoter, said catalyst being obtained by submitting the alumina support, containing the co-catalyst and calcined at a temperature comprised between about 450° and about 550° C.,

to a first treatment with a metal compound of the platinum group, said first treatment being followed by a calcination in air and by a reduction in the presence of hydrogen at a temperature between about 450° and 550° C.;

then to an intermediate treatment to deposit the promoter, said intermediate treatment being followed by a calcination at a temperature between about 380° and about 550° C.;

and finally to a second treatment with a metal compound of the platinum group, said second treatment being followed by a calcination at a temperature not exceeding 525° C.,

the dehydrogenation being carried out in the presence of said catalyst at a temperature between about 400° and 800° C., under a pressure between about 0.001 and 10 atm and at a weight hourly space velocity between about 0.1 and 21.

4,962,266

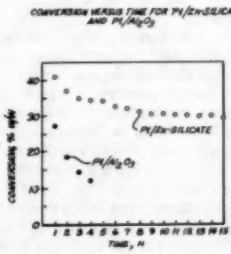
PROCESS TO CONVERT LINEAR ALKANES

Victor K. Shum, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Aug. 31, 1989, Ser. No. 401,978

Int. Cl.[5] C07C *5/333, 5/13*

U.S. Cl. 585—660 **19 Claims**



1. A process to convert a substantially linear alkane to dehydrogenated and isomerized products comprising contacting such alkane under conversion conditions with a catalyst composition comprising a platinum metal component and a zincosilicate component comprising a high surface area, crystalline silica molecular sieve, essentially aluminum free and containing between about 0.1 wt.% and about 5 wt.% nonexchangeable zinc, composited in an inorganic matrix, said sieve made by crystallization from an aqueous solution containing an organic base, an organic templating material, a zinc ion-affording material and an oxide of silicon and providing an X-ray pattern comprising the following X-ray diffraction lines and assigned strengths:

Interplanar Spacing d, Angstrom	Assigned Strength	Interplanar spacing d, Angstrom	Assigned Strength
11.34 ± 0.20	VS	3.87 ± 0.10	MS
10.21 ± 0.20	MS	3.84 ± 0.10	W
10.10 ± 0.20	MS	3.83 ± 0.10	M
9.88 ± 0.20	W	3.77 ± 0.10	W
6.05 ± 0.20	W	3.73 ± 0.10	M
5.75 ± 0.20	W		

4,962,267

DOUBLE BOND ISOMERIZATION PROCESS

Lyan H. Slaugh, Cypress, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 16, 1988, Ser. No. 285,577

Int. Cl.[5] C07C *5/23*

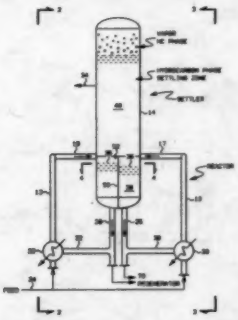
U.S. Cl. 585—670 **30 Claims**

1. A process for the double bond isomerization of an olefin feedstock comprising one or more C_4 or higher mono-olefins, which comprises contacting the feedstock under isomerization conditions with a catalyst comprising ruthenium oxide and an alkali metal oxide on an alumina support.

4,962,268
ALKYLATION CATALYST ISOLATION

Keith W. Hovis, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 22, 1989, Ser. No. 314,676
Int. Cl.[5] C07C 2/56
U.S. Cl. 585—705 12 Claims



1. Apparatus comprising:

a vessel defining a separation zone having a lower portion, an intermediate portion and an upper portion for separating a mixture containing a heavier liquid and a lighter liquid;

means for introducing said mixture containing a heavier liquid and a lighter liquid into said separation zone, to form a liquid-liquid interface in said separation zone, said interface occurring at a level between said heavier liquid and said lighter liquid, and wherein said heavier liquid is contained in said lower portion of said separation zone and wherein said means for introducing a mixture comprises reactor means for alkylating olefins with isoparaffins in the presence of a hydrogen fluoride catalyst;

means for passing reactor effluent comprising liquid hydrogen fluoride catalyst and liquid hydrocarbon product from said reactor means into said separation zone; and

means disposed within said vessel for dividing said lower portion of said separation zone into a plurality of chambers, for containing at least a major portion of said heavier liquid so that any leak resulting in the draining of said heavy liquid from any individual chamber of said plurality of chambers will not correspondingly result in the draining of said heavier liquid from the remaining unaffected chambers of said plurality of chambers.

4,962,269
ISOMERIZATION PROCESS

Rene B. LaPierre, Medford; Randall D. Partridge, W. Trenton, and Stephen S. Wong, Medford, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

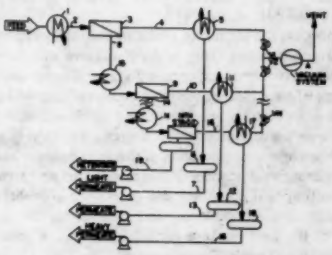
Continuation of Ser. No. 183,399, Apr. 13, 1988, Pat. No. 4,855,530, which is a continuation of Ser. No. 81,533, Aug. 4, 1988, abandoned, which is a continuation of Ser. No. 379,423, May 18, 1982, abandoned. This application Dec. 5, 1988, Ser. No. 280,399
The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.
Int. Cl.[5] C07C 5/13
U.S. Cl. 585—739 18 Claims

1. A process for catalytically isomerizing C_{10+} n-paraffins comprising contacting a hydrocarbon feedstock comprising C_{10+} n-paraffins wherein the aromatic content of the feedstock is less than about 20 weight percent of the feedstock and the initial boiling point of the feedstock is at least 150° C., under isomerization conditions, with a catalyst comprising (i) an acidic component which is a large pore zeolite having a framework silica/alumina ratio greater than 150:1 and a hydrocarbon adsorption capacity of at least 6% by weight at 50° C. and (ii) a hydrogenation component; and recoverin C_{10+} iso-para with C_{10} minus material content substantially equal to that of the feed.

4,962,270
MULTI-STAGE PERVAPORATION PROCESS RUN AT PROGRESSIVELY HIGHER VACUUM, HIGHER TEMPERATURE OR BOTH AT EACH SUCCESSIVE RETENTATE STAGE

Joseph L. Feimer, Bright's Grove, Canada; Robert C. Schucker, and Charles P. Darnell, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Feb. 27, 1989, Ser. No. 315,867
Int. Cl.[5] C02F 1/44
U.S. Cl. 585—819 5 Claims



1. A process for separating a multi-component feed stream into fractions of different molecular type and of different boiling point comprising feeding the multi-component feed stream to a multi-stage membrane pervaporation separation unit, the multi-component stream being the feed to a first separation stage producing a permeate and a retentate, the retentate from the first and each succeeding stage in turn being the feed to the next succeeding separation stage wherein the retentate which constitutes the feed to the next succeeding stage is heated to a temperature higher than that used in the preceding stage and wherein each succeeding permeation stage is run at a higher vacuum than that used in the preceding permeation stage to thereby fractionate the multi-component stream into numerous fractions of different molecular type and different boiling point.

4,962,271
SELECTIVE SEPARATION OF MULTI-RING AROMATIC HYDROCARBONS FROM DISTILLATES BY PERSTRACTION

Laura E. Black, Sarnia, Canada, and Robert C. Schucker, Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 19, 1989, Ser. No. 452,887
Int. Cl.[5] C07C 7/144
U.S. Cl. 585—819 10 Claims

1. A method for separating alkyl substituted and alkyl/-hetero-atom substituted multi-ring aromatic hydrocarbons having less than 75 mole % aromatic carbon from distillates containing mixtures of said hydrocarbons with single ring aromatics and non-aromatics by contacting the distillate under perstraction conditions with a selective membrane and permeating the alkyl substituted and alkyl/hetero-atom substituted multi-ring aromatic through said membrane.

4,962,272
TREATMENT OF ARSINE REMOVAL CATALYSTS

Leonard A. Callo, Hempfield Township, Westmoreland County, and Edward F. Restelli, Jr., Oakmont Boro, both of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Filed May 30, 1989, Ser. No. 358,287
Int. Cl.[5] C07C 7/12; B01J 38/04, 23/82; B01D 53/02
U.S. Cl. 585—826 21 Claims

1. Method of rejuvenating a metal oxide or mixed metal

oxide catalyst supported on a porous support, which catalyst has accumulated arsenic thereon, comprising passing through said catalyst an oxygen-free inert gas including up to about 80 mole percent moisture at a temperature of at least about 50° C. for at least one-half hour.

4,962,273

PURIFICATION OF ALPHA NAPHTHOL-CONTAINING FEEDSTOCK BY ADSORPTION

Hermann A. Zinnen, Evanston, and Steven P. Johnson, Prospect Heights, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Oct. 31, 1988, Ser. No. 264,707
Int. Cl.[5] C07C 7/12
U.S. Cl. 585—831 31 Claims

1. A process for purifying alpha naphthol by separating one or more components from a feed mixture containing alpha naphthol and one or more compounds selected from the group consisting of naphthalene, tetralin and tetralone which process comprises contacting, at adsorptive conditions, said feed mixture with an adsorbent material thereby selectively adsorbing one or more of the components of the feed mixture and thereafter recovering said adsorbed components to an extract stream by contacting said adsorbent material with a desorbent material, at desorptive conditions, and recovering the unadsorbed portion of the feed mixture including at least a portion of the alpha naphthol to a raffinate stream.

4,962,274

PROCESS FOR SEPARATING ALKYL-SUBSTITUTED NAPHTHALENE DERIVATIVES USING CLATHRATE COMPLEXES

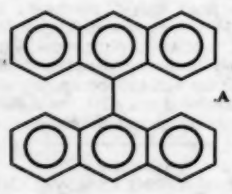
Fumio Toda, Shigenobu, Japan, assignor to Kureha Kagaku Kogyo K.K., Tokyo, Japan

Filed Sep. 7, 1989, Ser. No. 403,961
Claims priority, application Japan, Sep. 10, 1988, 63-225540; Sep. 10, 1988, 63-225541; Feb. 15, 1989, 1-33674
Int. Cl.[5] C07C 7/152
U.S. Cl. 585—833 4 Claims

1. A process for the separation of an alkyl-substituted naphthalene derivative selected from the group consisting of 2-methylnaphthalene, 2-isopropylnaphthalene and 2,6-diisopropylnaphthalene from a mixture containing the desired alkyl-substituted naphthalene derivative and at least one isomer thereof, which comprises:

bringing 9,9'-bianthracene into contact with the mixture to form a clathrate complex represented by the following formula (I):

(I)



wherein A represents the alkyl-substituted naphthalene derivative;

collecting the clathrate complex by filtration; subjecting the clathrate complex to thermal decomposition; and

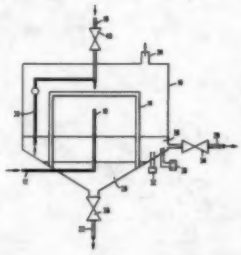
recovering the alkyl-substituted naphthalene derivative.

4,962,275

METHOD AND APPARATUS FOR SUPERCRITICAL FLUID EXTRACTION SOLUTION SEPARATION

Thomas J. Bruno, Broomfield, Colo., assignor to United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Feb. 21, 1990, Ser. No. 482,589
Int. Cl.[5] C07C 7/10
U.S. Cl. 585—834 20 Claims



9. A method for the separation of a desired product from a supercritical fluid extraction solution, comprising

(a) decompressing the supercritical fluid extraction solution by passing it through a restrictor nozzle;

(b) directing the decompressed fluid stream at a coarse-pore sintered-glass or sintered metal enclosure member which is saturated with a oil in which the desired product is soluble, causing gaseous solvent to escape through the coarse pores of the enclosure member and at least one solute comprising the desired product to dissolve in the oil; and

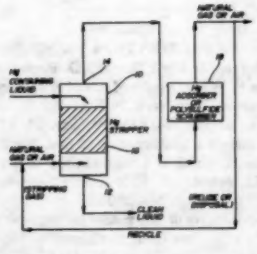
(c) collecting the oil containing the desired product.

4,962,276

PROCESS FOR REMOVING MERCURY FROM WATER OR HYDROCARBON CONDENSATE

Tsoung Y. Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Jan. 17, 1989, Ser. No. 297,157
Int. Cl.[5] C07C 7/00; C10G 29/20
U.S. Cl. 585—867 21 Claims



1. A method for removing mercury from hydrocarbon condensate comprising:

providing a stripper having a top, a bottom, and a packing therein;

forming said hydrocarbon condensate into a spray;

introducing said spray into said stripper and into contact with said packing;

flowing a gas stream through said stripper, thereby stripping mercury from said hydrocarbon condensate;

removing said stripped hydrocarbon condensate from the bottom of said stripper; and

removing said gas, including said stripped mercury, from the top of said stripper.

4,962,277

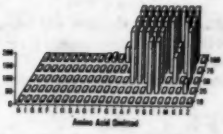
DELETION ANALOGUES OF MAGAININ PEPTIDES

Julio H. Cuervo, Cardiff, and Richard A. Houghten, Solana Beach, both of Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Filed Dec. 9, 1988, Ser. No. 281,981

Int. Cl.[5] A61K *37/02*; C07K *7/08*

U.S. Cl. 514—14 **45 Claims**



1. A compound comprising:

a deletion analogue of an amide or carboxy terminated Magainin I wherein Magainin I is represented by the following structural formula using the single letter amino acid code and the numbers below each amino acid residue refer to the position of the residue in the peptide:

G I G K F L H S A G K F G K A F V G E I M K S
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

and at least one of amino acids **15** through **23** is omitted.

4,962,278

NOVEL AZOLE DERIVATIVE AND AGRICULTURAL/HORTICULTURAL FUNGICIDE CONTAINING SAID DERIVATIVE AS ACTIVE INGREDIENT

Hiroyuki Enari; Satoru Kumazawa; Susumu Shimizu; Atsushi Ito; Nobuo Sato, and Toshihide Saishojo, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

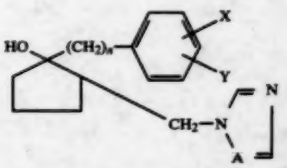
Division of Ser. No. 129,629, Dec. 7, 1987, Pat. No. 4,902,702. This application Nov. 30, 1989, Ser. No. 443,582

Claims priority, application Japan, Dec. 22, 1986, 61-305908

Int. Cl.[5] A01N *43/50*; C07D *233/60*

U.S. Cl. 514—399 **3 Claims**

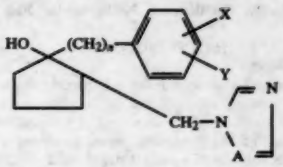
1. An azole derivative represented by the formula (I);



(I)

wherein X and Y indepenently represent a halogen atom, a phenyl group or a hydrogen atom, provided that at least one of X and Y is not a hydrogen atom, n represents an integer of 0, 1 or 2, and A represents a CH group.

2. An agricultural/horticultural fungicide comprising as an active ingredient a fungicidally effective amount of an azole derivative represented by the formula (I):



(I)

wherein X and Y independently represent a halogen atom, a phenyl group or a hydrogen atom, provided that at least one of X and Y is not a hydrogen atom, n represents an integer of 0, 1 or 2, and A represents a CH group together with an acceptable carrier or diluent.

4,962,279

KAOLIN CALCINER WASTE HEAT AND FEED RECOVERY PROCESS

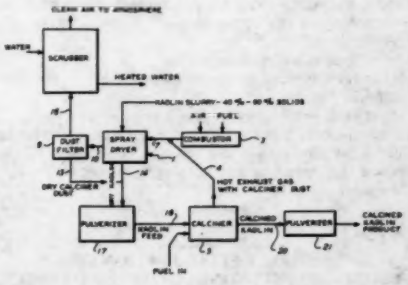
Charles D. Anderson; Carl S. Cummings, both of Warthen, and J. Richard Hudson, McIntyre, all of Ga., assignors to ECC America Inc., Atlanta, Ga.

Continuation of Ser. No. 917,657, Oct. 9, 1986, abandoned, which is a continuation-in-part of Ser. No. 870,222, Jun. 3, 1986, Pat. No. 4,717,559. This application Feb. 3, 1989, Ser. No. 307,206

The portion of the term of this patent subsequent to Jan. 5, 2005, has been disclaimed.

Int. Cl.[5] C04B *33/04*

U.S. Cl. 501—150 **14 Claims**



1. In the process for production of a calcined kaolin clay wherein an aqueous kaolin clay slurry is subjected to at least one filtration process to produce an aqueous kaolin clay slurry having a solids content in the range of 40 to 60 weight percent, and said aqueous kaolin clay slurry is dried in a spray dryer which is provided with heated gases from a combustor, and then calcined in a calciner; the improvement which comprises: drying said aqueous kaolin clay slurry in the spray dryer by cycling the hot exhaust gases and entrained calciner kaolin dust from said calciner back to said spray dryer by joining the said hot exhaust gases and calcined kaolin dust with the said heated combustor gases being provided to said spray dryer; recovering dried kaolin particles from the spray dryer and recovering calciner and kaolin dust from the gases exiting from said spray dryer for use as feed for said calciner; bringing the gaseous effluent thereby produced from said spray dryer into direct counter-current contact with water in a scrubber to heat said water and remove any remaining particles and dust; and utilizing the resultant heated water to heat the feed to said filtration process.

4,962,280

CARRIER MATERIAL FOR A CATALYST AND A PROCESS FOR MAKING SUCH A CARRIER MATERIAL

Ivo I. M. Tijburg, Utrecht, and John W. Geus, Bilthoven, both of Netherlands, assignors to Engelhard de Meern B. V., Strijkvicrtel, Netherlands

Filed Feb. 1, 1989, Ser. No. 305,158

Claims priority, application Netherlands, Feb. 2, 1988, 8800251

Int. Cl.[5] B01J *32/00*

U.S. Cl. 502—439 14 Claims

1. A carrier material containing a substrate essentially consisting of aluminium oxide, possibly in combination with a different metal oxide; and a compound of a metal ion different from the metal of the substrate metal oxide or oxides and located on the surface of said substrate; said carrier material being characterized in that the metal of said compound of a metal ion is of the 3rd or 4th subgroup of the Periodic Table and is so uniformly distributed that, after a treatment at 1000° C. for 6 hours, the carrier material does not exhibit diffraction maximums in the X-ray diffraction pattern with a half-value width of less than 1.0 degree of arc (measured over the double diffraction angle).

4,962,281

SYNTHESIS OF STEREOREGULAR POLY(PROPYLENE OXIDE)

David E. Laycock, Sarnia, Canada, assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 808,803, Dec. 13, 1985. This application Aug. 21, 1989, Ser. No. 396,576

Int. Cl.[5] C08G *65/10*

U.S. Cl. 528—413 14 Claims

1. A process for producing stereoregular, crystalline, isotactic poly(propylene oxide) comprising reacting, at a temperature of at least about 100° C. and no greater than about 130° C., propylene oxide in the presence of a catalytic amount of a particulate solid catalyst formed by calcining, at a temperature of about 450° C. to about 550° C., a catalyst precursor having an elemental analysis comprising:

(a) aluminum;

(b) at least one secondary metal:

(c) oxygen, bonded to aluminum and the secondary metal: and

(d) at least one Lowry-Bronsted anionic base,

in such amounts that the catalyst precursor is a solid having hydrotalcite structure, under reaction conditions sufficient to produce the stereoregular, crystalline, isotactic poly(propylene oxide).

4,962,282

DIRECT FLUORINATION OF FLUORO-BETA-SULTONES IN ORDER TO PRODUCE THE CORRESPONDING FLUOROOXY-FLUOROSULFONYL-FLUORO-COMPOUNDS

Antonio Marraccini, Novara, and Gabriele Perego, Torino, both of Italy, assignors to Ausimont S.r.l., Milan, Italy

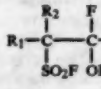
Filed Feb. 13, 1990, Ser. No. 479,518

Claims priority, application Italy, Feb. 13, 1989, 19425 A/89

Int. Cl.[5] C07C *303/02*

U.S. Cl. 562—825 14 Claims

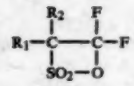
1. Process for preparing, in one single reaction step, fluorooxy-fluorosulfonyl-fluorocompounds of formula:



(II)

R_1 and R_2, which can be either equal to, or different from, each other, represent a fluorine or chlorine atom, or an alkyl radical partially or totally halogenated with fluorine and/or chlorine,

characterized in that a gaseous stream constituted by a mixture of fluorine and of a fluoro-β-sultone of formula:



(I)

wherein R_1 and R_2 have the above stated meaning, is caused to continuously flow on a fluorination catalyst at temperatures comprised within the range of from −30° C. up to +100° C., and under pressures comprised within the range of from 50 to 800 kPa, with the reaction product being continuously removed from the same fluorination catalyst.

4,962,283

SINGLE PASS CONTINUOUS UREA-SULFURIC ACID PROCESS

Bruce A. Harbolt, Hacienda Heights, and Donald D. Moerdyke, Northridge, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Feb. 28, 1989, Ser. No. 316,988

Int. Cl.[5] C07C *273/02*

U.S. Cl. 564—63 14 Claims

2. A process for producing a concentrated solution of urea and sulfuric acid which comprises, in the absence of a heel of reaction product, introducing solid particulate urea entrained in air in a continuous stream into a reaction zone, simultaneously and independently introducing sulfuric acid in a continuous spray into said reaction zone, and simultaneously and independently introducing water into said reaction zone as a continuous spray, the quantity of air entraining said solid particulate urea being sufficient to control the temperature in said reaction zone to below the incipient decomposition temperature of the resulting urea-sulfuric acid solution; and continuously removing from said reaction zone and recovering a product comprising a concentrated urea-sulfuric acid solution.

4,962,284

ALKANOYL ANILIDES

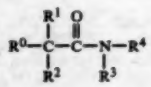
Robert P. Gajewski, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 836,658, Mar. 5, 1986, Pat. No. 4,826,841, which is a continuation-in-part of Ser. No. 720,236, Apr. 5, 1985, abandoned. This application Mar. 6, 1989, Ser. No. 319,453

Int. Cl.[5] C07C *233/00*

U.S. Cl. 564—194 31 Claims

1. A compound of formula I



I

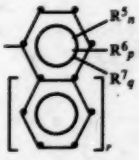
wherein

R^0 represents
bromo,
chloro, or
fluoro;

R^1 represents
CF_3,
C_2F_5,
C_3F_7, or
a n-, iso-, or sec-C_4F_9;

R^2represents
CF_3, C_2F_5, or C_3F_7, or,
when R^0 represents fluoro, R^2 can additionally represent
—OR_f

—$N(R_f)_2$,
—CN,
13 CF_2—OR_f, or —CF_2—$N(R_f)_2$
and each R_f independently represents perfluoroloweralkyl of C_1–C_4 or, in —$N(R_f)_2$ both R_f groups can be taken together with the N and constitute perfluoropyrrolidino, perfluoropiperidino, perfluoromorpholino, or N-(trifluoromethyl)perfluoropeiperazino;
R^3 represents
hydrogen, or
methyl; and
R^4 represents
5-nitro-2-pyridyl, thiocyanatophenyl bearing a single additional substitutent which is fluoro, chloro, bromo, iodo, or nitro, or
substituted aryl of the formula



wherein each R^5 independently represents
bromo,
chloro, or
fluoro;
each R^6 independently represents
iodo,
nitro,
cyano,
trifluoromethyl,
fluorosulfonyl,
methylsulfonyl,
ethylsulfonyl,
carbomethoxy, or
carboethoxy;
R^7 represents
methyl, or,
when two R^6 moieties represent nitro at the 2-and 4-positions, R^8 can additionally represent C_1–C_4 alkoxy or C_1–C_4 alkylthio located at only the 3- or 5-position;
n represents 0–5; p represents 0–2 except that p can additionally represent 3 but only where two R^6 moieties represent nitro and a third R^6 moiety represents trifluoromethyl; q represents 0, or, when at least one R^5, nitro, or fluorosulfonyl group is present, 1; r represents 0 or 1; and the sum of n, p, and q is: 2–5 when each of p, q, and r is 0; 2–3 when any one of p, q, or r is at least 1, except that when p is one and R^6 is 4-nitro, the sum of n and p can additionally be 1;
or a sodium, potassium, or ammonium salt of a foregoing compound, wherein ammonium is of the following formula

wherein each R^8 independently represents alkyl of C_1–C_{20}, benzyl, 2-hydroxyethyl, 2-hydroxypropyl, or 3-hydroxypropyl; and R^9 represents hydrogen or R^8, the total number of carbon atoms in all R^8 and R^9 moieties being from 12 to 60, except that when one or more R^8 groups are 2-hydroxyethyl, 2-hydroxypropyl, or 3 TM hydroxypropyl, the total number of carbon atoms in all R^8 and R^9 moieties can be from 6 to 60.

4,962,285

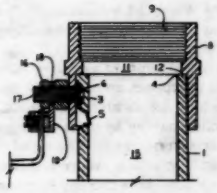
ELECTRICALLY GROUNDABLE SWIMMING POOL DECK ANCHOR OF PLASTIC MATERIAL

William H. Baker, 50 Fairway Ridge, Clover, S.C. 29710

Filed Nov. 4, 1988, Ser. No. 267,487

Int. Cl.[5] E02D *27/42*; E04H *4/06*; H01R *4/66*

U.S. Cl. 174—6 10 Claims



1. An electrically groundable swimming pool deck anchor of plastic material, adapted for mounting in the swimming pool deck flush with the deck surface, comprising, in combination:

(1) a housing of plastic electrically insulating material;

(2) a socket in the housing having an open end for reception of a swimming pool component to be anchored therein;

(3) a coupling means on the housing fro retaining in the socket in the swimming pool component when inserted in the open end of the socket in the housing;

(4) an opening through a side wall of the housing communicating with the socket and extending to the outside of the socket;

(5) a resilient member in the opening in a position to engage, but only in direct electrical grounding contact, a swimming pool component when inserted in the socket; and accessible from the interior of the socket; and

(6) means forming an electrical grounding connection with the resilient member and mounted on the outside of the housing.

4,962,286

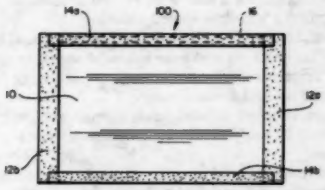
ENVIRONMENTAL CONTROL, LINER FOR SPLICE ENCLOSURE

Michael L. Jensen, Cary; Craig D. Ray, Raleigh; Thomas Hunter, Cary, and Keith Dawes, Raleigh, all of N.C., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Oct. 6, 1988, Ser. No. 254,335

Int. Cl.[5] H02G *15/113*

U.S. Cl. 174—92 14 Claims



1. An environmental closure capable of sealing around a spliced portion of a cable or between a first and a second cable or multiple cables to inhibit the degradation of the exposed internal cable wires from moisture and oxygen comprising:

conductive means for conductively joining opposing first and second cable ends together around a cable splice therebetween;

sealing means for sealing to the opposing first and second cable ends with the cable splice and means for conductively joining the opposing first and second cable ends therebetween;

removable sealing means for sealing to the means for sealing the opposing first and second cable ends;

an environmental liner film longitudinally adhered to itself through a removable sealing means and also adhered to the removable sealing means on the opposing ends of the first and second cables under pressure; and

pressure maintaining means to maintain the environmental liner film adhered to itself and the opposing first and second cable ends.

9. A reenterable method of environmentally sealing a cable comprising:

providing substantially permanent sealing means on opposing cable ends of a cable splice with the cable splice therebetween;

contacting the substantially permanent sealing means with a non-adhesive but substantially oxygen and water impervious material;

removably sealing an oxygen and water impervious barrier material to the non-adhesive material with a gel under pressure; and

pressuring the oxygen and water barrier having the gel therebetween to the cable ends.

4,962,287

FLEXIBLE PRINTED WIRE BOARD

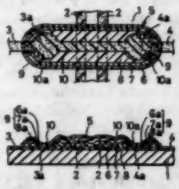
Nobuyuki Oshima, Ishinomaki, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Feb. 16, 1989, Ser. No. 312,014

Claims priority, application Japan, Apr. 14, 1988, 63-50401[U]

Int. Cl.[5] H05K *1/00*

U.S. Cl. 174—261 9 Claims



1. A flexible printed wire board comprising:

a flexible film;

a wiring pattern having a first, a second, and a third conductive pattern formed on the flexible film;

an insulation coating, wherein a part of the first conductive pattern is coated with the insulation coating which is comprised of a plurality of overlapping layers of insulation which cover the first conductive pattern at a crossover point, said second and third conductive patterns are spaced and insulated from the first conductive pattern; and

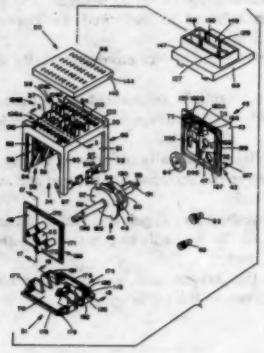
a crossover pattern formed on the insulation coating traversing the first conductive pattern connecting said second and said third conductive patterns, said plurality of overlapping layers of insulation are so configured that between any two layers stacked one upon the other, a top layer stacked on a bottom layer each having a layer edge, a top surface of said bottom layer is exposed from said bottom layer edge for a predetermined distance along said top surface of said bottom layer to the layer edge of said top layer, at which point said top layer is disposed on said bottom layer.

4,962,288

TIMER WITH IMPROVED ELECTRICAL BUSSING

Ronald E. Cole, Greenwood, Ind., assignor to Emhart Industries, Inc., Towson, Md.

Filed Mar. 29, 1989, Ser. No. 330,163
Int. Cl.[5] H01H *43/10, 1/58;* H01R *9/00, 29/00*
U.S. Cl. 200—38 R 12 Claims



1. In an electromechanical timer comprising a motor-driven cam, electrical switches responsive to said cam, and electrical terminals connected to said switches and aligned in a row, all of which are supported by a housing, the improvement comprising:

first insulating means formed in said housing for defining a first channel spaced from said row of terminals;

first electrical bus means secured in said first channel;

second insulating means formed in said housing for defining a plurality of second channels, each channel connecting said first channel and one of said terminals, with each of said second channels being shaped with sufficient arc that said first bus means and any one of said terminals cannot be connected by a straight line in the plane of and passing through its corresponding second channel without also passing through said second insulating means; and

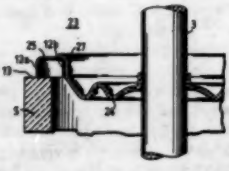
second electrical bus means secured in a least two of said second channels and electrically connecting said first bus means and selected ones of said terminals.

4,962,289

SWITCH CHAMBER FOR A VACUUM SWITCH

Karl Stegmüller, Wiesent, Fed. Rep. of Germany, assignor to Sachsenwerk Aktiengesellschaft, Regensburg, Fed. Rep. of Germany

Filed Jul. 27, 1989, Ser. No. 385,427
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1988, 3825407
Int. Cl.[5] H01H *33/66*
U.S. Cl. 200—144 B 23 Claims



1. In a switch chamber for a vacuum switch comprising: a housing including at least one insulating tube having a frontal face; a contact pin for supporting the switch chamber relative to an external member; a terminating cover connecting the insulating tube with the contact pin in a vacuum-tight manner; a stationary contact held by the contact pin inside the housing; a movable contact having a frontal face adjacent the stationary contact and being movable approximately in the axial direction of the insulating tube; and a bellows forming a vacuum-tight connection between the movable contact and the housing; wherein in the switched-on position of the vacuum switch the frontal face of the movable contact contacts the stationary contact under action of a contact spring force and shock stresses generated when the vacuum switch is turned on are transferred to the housing by the terminating cover, the improvement wherein:

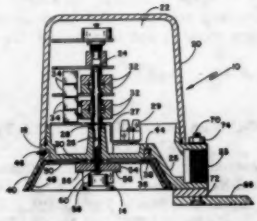
said insulating tube comprises a ceramic tube; and said terminating cover comprises an elastically deformable section and a plastically deformable section, said elastically deformable section having an inner end connected with said contact pin and an outer end connected to said plastically deformable section which in turn is fastened to the frontal face of said ceramic tube thereby forming a vacuum-tight housing and minimizing stresses between said terminating cover and said ceramic tube resulting from switching operations, short-circuits and shrinkage caused by manufacturing processes.

4,962,290

SHAFT POSITION INDICATING AND DISPLAY MEANS WITH ADJUSTABLE MOUNTING ADAPTER

Gerald J. Nelson; Wally Stommes, both of Fergus Falls, and John Rose, Underwood, all of Minn., assignors to Stonel Corporation, Fergus Falls, Minn.

Filed Nov. 13, 1989, Ser. No. 434,368
Int. Cl.[5] H01H *3/32, 19/60, 9/16*
U.S. Cl. 200—308 8 Claims



1. Rotary shaft position indicating and display means for use with a device having a rotatable shaft and a planar mounting surface, comprising:

(a) a housing having a base with a cover secured to said base and defining a hollow sealed chamber;

(b) an actuator shaft journaled for rotation in said base and extending through said base into said sealed chamber;

(c) at least one electromechanical actuating element mounted on said actuator shaft;

(d) means coupled to said base within said chamber for actuation by said at least one electromechanical actuating element;

(e) a first frusto-conical member secured to the under side of said base, said first member being downwardly and outwardly flared and being formed from at least in part of a transparent plastic material to define at least one window area;

(f) a second frusto-conical member concentrically disposed relative to said first frusto-conical member and including graphics information viewable through said at least one window area;

(g) first spacer means of a predetermined height dimension and having first and second side surfaces, the first side surface abutting and affixed to said actuator shaft and to

said second frusto-conical member for rotating said second frusto-conical member with said actuator shaft; and

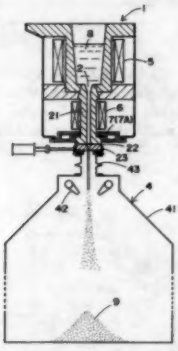
(h) yoke means secured to the second side surface of said first spacer means for coupling said first spacer means to said rotatable shaft of said device.

4,962,291

APPARATUS FOR PRODUCTION METAL POWDER HAVING A SHIELDED RUNNER NOZZLE GATE

Senji Fujita, Nagoya, and Noboru Demukai, Gifu, both of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, Japan

Filed Sep. 6, 1989, Ser. No. 403,440
Claims priority, application Japan, Sep. 7, 1988, 63-224296
Int. Cl.[5] H05B *6/40*
U.S. Cl. 219—10.491 **3 Claims**



1. An apparatus for producing metal powder comprising:

a molten metal holding vessel having a generally cylindrical shaped bottom portion;

a molten metal discharging runner located at said bottom portion of said holding vessel, said discharging runner having a nozzle portion which comprises of a sliding gate made of ceramic, said sliding gate being movable for controlling the flow of said molten metal through said nozzle portion of said discharging runner;

a spraying chamber connected at a lower end portion of said discharging runner, said spraying chamber having gas-jetting nozzles;

a first induction heating coil having a diameter and surrounding said holding vessel;

a second induction heating coil surrounding said discharging runner, said second induction heating coil having a diameter smaller than a diameter of said first induction heating coil; and

a ring-shaped magnetic shielding plate disposed between said second induction heating coil and said sliding gate, said shielding plate having a cooling means for cooling said shielding plate.

4,962,292

HIGH-FREQUENCY HEATING APPARATUS HAVING DIGITAL CONTROLLED INVERTER

Masayuki Aoki, Ichinomiya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 22, 1989, Ser. No. 369,706
Claims priority, application Japan, Jun. 27, 1988, 63-158705
Int. Cl.[5] H05B *6/68*
U.S. Cl. 219—10.55 B **17 Claims**

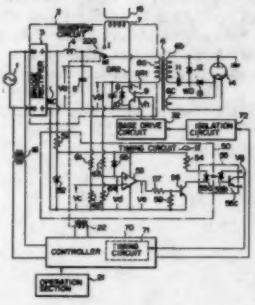
1. A high-frequency heating apparatus comprising:

a high-frequency heat source for supplying a predetermined high-frequency heating output;

inverter means for receiving an AC input and supplying a high-frequency output to drive said high-frequency heat source, including means for rectifying the AC input, and a switching element for switching a DC output from said rectifying means;

timing means, coupled to said inverter means, for detecting a switching timing of said switching element in said inverter means, the timing means including a means for receiving a pulse current output from said rectifying means in said inverter means to output a DC output for driving said timing means;

control means for outputting an ON/OFF signal having a



predetermined duty ratio corresponding to a heating output set value associated with the predetermined high-frequency heating output, the ON/OFF signal being output at a predetermined timing in response to a detection output from said timing means;

driving means for driving said switching element in said inverter means in response to the ON/OFF signal output from said control means;

first isolating means for electrically isolating said timing means from said control means; and

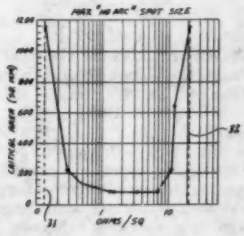
second isolating means for electrically isolating said control means from said driving means.

4,962,293

MICROWAVE SUSCEPTOR FILM TO CONTROL THE TEMPERATURE OF COOKING FOODS

Donald V. Lackey, Salt Point, N.Y., assignor to Dunmore Corporation, Newtown, Pa.

Filed Sep. 18, 1989, Ser. No. 408,566
Int. Cl.[5] H05B *6/80*
U.S. Cl. 219—10.55 E **21 Claims**



1. A metallic coated substrate capable of reaching a predetermined surface temperature upon being exposed to microwave energy of a known strength, said substrate including

a base of sheet material,

a metal coating on said base, said coating being formed in a plurality of discrete metal areas having a predetermined surface resistivity, the size of individual said discrete metal

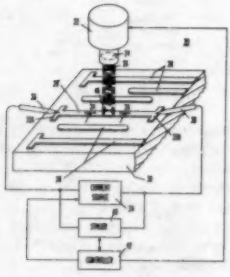
areas being below the intra-area arcing size for said surface resistivity, and said resistivity being such that said discrete metal areas will come to said predetermined surface temperature when said coated substrate is exposed to said microwave energy.

4,962,294

METHOD AND APPARATUS FOR CAUSING AN OPEN CIRCUIT IN A CONDUCTIVE LINE

Keith F. Beckham, Wallkill; David C. Challener, Hopewell Junction; Arunava Gupta, Valley Cottage; Joseph M. Harvilchuck, Billings, all of N.Y.; James M. Leas, Bethesda, Md.; James R. Lloyd, Natick, Mass.; David C. Long; Horatio Quinones, both of Wappingers Falls, N.Y.; Krishna Seshan, Beacon, and Morris Shatzkes, Monsey, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 14, 1989, Ser. No. 322,955
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.68 **36 Claims**



1. A method for causing an open circuit in an electrical conductor, comprising the steps of:

providing said conductor having a cross-sectional area in the range of about 0.05–1500 square microns;

conducting a direct current through said conductor, said direct current being of a magnitude less than that required to vaporize said conductor; and

applying heat at a selected location on said conductor whereat it is desired to cause the open circuit of said conductor, said heat being less than that required to vaporize said conductor;

whereby said conducting and applying steps together effect an open circuit in said conductor.

4,962,295

INCANDESCENT HEATING UNIT

Joseph D. Gilmore, Rte. 6, Box 379-A, Lancaster, S.C. 29720

Filed May 19, 1989, Ser. No. 354,475
Int. Cl.[5] H05B *3/44*
U.S. Cl. 219—217 **7 Claims**

1. In a chair of the type having a metal portion arranged to be positioned against an occupant of the chair, the combination of means for heating said metal portion of the chair to warm an occupant of the chair, said means comprising:

(a) a low wattage incandescent light bulb,

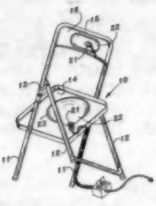
(b) means connecting the light bulb to a source of electrical energy,

(c) a reflector surrounding the light bulb,

(d) means for holding the reflector snugly against said metal portion of the chair with the light bulb between the reflector and said metal portion of the chair,

(e) a dispersion disk, and

(f) means supporting the dispersion disk between the light bulb and said metal portion of the chair, whereby the light bulb can be energized to generate heat to be dispersed across said metal portion of the chair by the dispersion



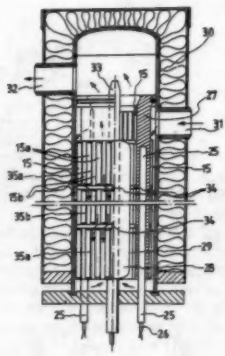
disk to cause said metal portion of the chair to absorb the heat and warm the occupant of the chair.

4,962,296

HEAT EXCHANGER

Karl Östbo, Fredhallsgatan 7, Stockholm, Sweden (11254)

Filed Oct. 31, 1988, Ser. No. 264,978
Claims priority, application Sweden, Aug. 26, 1983, 8304626
Int. Cl.[5] F24H *1/12, 3/06;* F28F *21/08*
U.S. Cl. 219—306 **5 Claims**



1. A heat exchanger comprising:

a core body enclosing therein a plurality of electric resistance elements, said core body being enclosed within a casing governing the flow of a heat-transporting medium outside said core body, said core body including a plurality of elongate blocks of a cast metal each having four side faces and a high heat-conducting capacity, at least one tube having a roughened outward face and enclosing at least one electric resistance element embedded in each said elongate block and integral therewith, the side faces of said blocks being each provided with outwardly projecting flanges having outer edges thereon and running parallel to the direction of elongation of said blocks for presenting contact surfaces to said heat-transporting medium, the flanged side faces of each of said blocks being cut by transverse grooves therein imterrupting and subdividing each said flanged side face into plural flanged sections, the flanges of each said flanged section being displaced laterally in relation to the flanges of a respective following section whereby the flanges of each said flanged section are aligned with gaps between the flanges of the respective preceding and following sections in the direction of flow, said blocks being packed closely together within said casing with said outer edges of juxtaposed flanges abutting together, a plurality of flow paths for said heat-transporting medium being defined by gaps between

juxtaposed flanged side faces of said blocks and between outwardly facing side faces of said blocks of said core and said casing for thereby providing a plurality of tortuous flow passages for said heat-transporting medium along said faces of said blocks.

4,962,297

TEMPERATURE CONTROLLED HOT PLATE

Eva G. U. Löwenberg, Stockholm, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

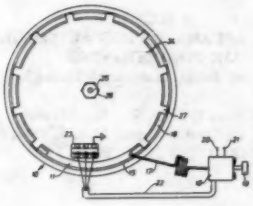
PCT No. PCT/SE89/00163, § 371 Date Jan. 17, 1990, § 102(e) Date Jan. 17, 1990, PCT Pub. No. WO89/09532, PCT Pub. Date Oct. 5, 1989

PCT Filed Mar. 30, 1989, Ser. No. 435,530

Claims priority, application Sweden, Mar. 30, 1988, 8801195

Int. Cl.[5] H05B *3/70*

U.S. Cl. 219—449 **5 Claims**



1. A temperature controlled hot plate (**10**) with a plate body (**11**) comprising an upper plane heat emitting surface and a lower surface on which at least one heating coil (**13**) is provided enclosed in insulating (**14**), an elongated temperature sensor (**16**) being arranged to be pressed against the insulation (**14**) to be directly influenced by heat emitted by the heating coil (**13**), the sensor containing an expandable fluid, and the hot plate body being provided with an annular flange (**15**) surrounding the insulation, characterized in that the heating coil (**13**) along part of its length follows the annular flange (**15**) at some distance from the flange, and that the temperature sensor (**16**) is disposed along the border between the insulation (**14**) and the flange (**15**) so as to be in metallic contact with the flange.

4,962,298

MACHINE FOR THERMALLY TREATING AND STERILIZING PRE-PACKAGED FOOD ARTICLES BY MEANS OF MICROWAVES

Claudio Ferrari, and Oreste Caselli, both of Reggio Emilia, Italy, assignors to Barilla G.E.R. F.LII-Societa per Azoni, Parma, Italy

Filed Jul. 18, 1989, Ser. No. 381,359

Claims priority, application Italy, Jul. 18, 1988, 21405 A/88

Int. Cl.[5] H05B *6/78*

U.S. Cl. 219—10.55 A **7 Claims**

1. A machine for thermally treating and sterilizing pre-packaged food articles by means of microwaves, comprising:

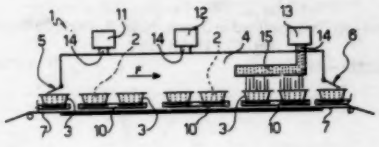
an elongated treatment tunnel provided with an inlet port and an outlet port;

a movable conveyor extending longitudinally within the tunnel between said ports to convey packages of food articles laid in parallel rows on said conveyor;

a plurality of microwave generators disposed in spaced relation longitudinally along said conveyor,

a plurality of microwave radiators connected to said generators and arranged to face said rows, respectively, and

a plurality of elongated microwave resonance chambers connected to each respective microwave radiator connected to the generator closest to said outlet port and extending parallel to said conveyor above each respective row with each microwave resonance chamber having an



elongated rectangular box-like configuration and having a plurality of slots formed in a chamber wall facing said conveyor.

4,962,299

METHOD AND APPARATUS FOR THE THERMAL CONTROL OF A HEATING DEVICE

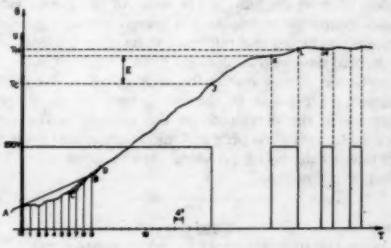
Alain Duborper; Gilles Miquelot; Paul Rivier, and Roger Rosset, all of Rumilly, France, assignors to SEB, S.A., France

Filed Jun. 19, 1989, Ser. No. 367,617

Claims priority, application France, Jun. 22, 1988, 88 08379

Int. Cl.[5] H05B *1/02*

U.S. Cl. 219—492 **22 Claims**



12. An electrically heated cooking vessel for heating a substance to at least one predetermined maximum temperature TM, the cooking vessel comprising:

a container for the substance;

electric heating means;

means for activating and deactivating the electric heating means;

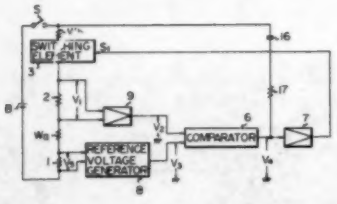
a sensor for measuring a temperature of the container corresponding to a temperature of the substance to be heated by the electric heating means;

a microprocessor programmed to plot a profile, at regular intervals after activation of the electric heating means of the temperature measured by the sensor, to calculate the instantaneous and mean slopes of the temperature profile, to calculate as a function of one of said slopes a temperature difference E between the maximum temperature TM and a predicted value of the temperature measured by the sensor at which to deactivate the electric heating means such that temperature inertia of the apparatus will allow the temperature of the substance to rise to TM, and to operate the means for deactivating the electric heating means when the measured temperature of the substance reaches a value TC which is slightly lower than the value of TM minus E.

4,962,300
PREHEATING CONTROL APPARATUS FOR DIESEL ENGINES

Kiyoshi Watanabe, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1981, Ser. No. 239,608
Claims priority, application Japan, Mar. 3, 1980, 55-26296
Int. Cl.[5] H05B 1/02
U.S. Cl. 219—497 8 Claims



1. A preheating control apparatus for diesel engines, which controls the preheating of a glow plug having a predetermined resistance-temperature coefficient, comprising:

a resistor connected in series with said glow plug;

means for amplifying a voltage developed across said resistor;

means for generating a reference voltage;

means for comparing the output level of said amplifying means with the level of said reference voltage; and

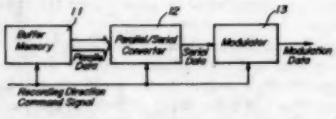
a switching means for controlling a current supplied to said glow plug on the basis of the result of the comparison in said comparing means, said reference voltage generating means producing said reference voltage on the basis of the potential develped across said glow plug; and

a protection circuit means for turning off said switching means in response to the occurrence of an abnormal change in the magnitude of the voltage in the circuit including said glow plug and said resistor, said protection circuit means being provided on the input side of said amplifying means.

4,962,301
METHOD OF RECIPROCALLY RECORDING DATA ON CARD-LIKE RECORD MEDIUM FOR UNIDIRECTIONAL READING

Takao Rokutan, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Jan. 20, 1988, Ser. No. 146,247
Claims priority, application Japan, Jan. 30, 1987, 62-18715
Int. Cl.[5] G06K 1/12; G11B 7/007
U.S. Cl. 235—487 6 Claims



1. A method of recording data on a card-like record medium by moving the card-like record medium reciprocally in normal and reverse directions with respect to a recording head, comprising:

recording data in the normal direction, comprising the steps of:

(i) modulating data to be recorded in the normal direction in accordance with a predetermined modulation method using a first conversion table to produce first modulated data; and

(ii) writing the first modulated data in the normal direction on said card-like record medium; and

recording data in the reverse direction, comprising the steps of:

(i) reversing the order of data to produce reverse data;

(ii) modulating the reverse data to be recorded in the reverse direction in accordance with the predetermined modulation method using a second conversion table to produce second modulated data; and

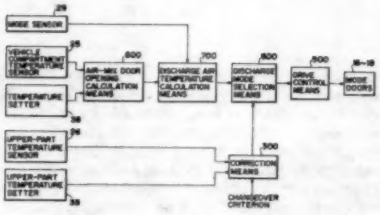
(iii) writing the second modulated data in the reverse direction on said card-like record medium, said second conversion table being formed such that said data recorded in the reverse direction is reproducible by demodulating read out data in accordance with said first conversion table, wherein;

said data is recorded in the normal and reverse directions such that said card-like record medium is reproduced by moving said card-like record medium in either the normal or reverse direction.

4,962,302
CONTROL APPARATUS FOR AUTOMOBILE AIR-CONDITIONERS

Iida Katsumi, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Japan

Filed Nov. 2, 1989, Ser. No. 430,606
Claims priority, application Japan, Nov. 4, 1988, 63-278944
Int. Cl.[5] G05D 23/00; B60H 1/00
U.S. Cl. 236—13 5 Claims



1. An apparatus for controlling an automobile air-conditioner, comprising:

(a) a vehicle compartment temperature sensor for detecting a representative temperature in a vehicle compartment;

(b) an upper-part temperature sensor for detecting a temperature of an upper part of the vehicle compartment;

(c) a temperature setter for setting a temperature in the vehicle compartment;

(d) an upper-part temperature setter for setting a temperature of the upper part of the vehicle compartment;

(e) mode doors disposed respectively at a plurality of differently directed outlets for changing the discharge mode of the air-conditioner;

(f) mode control value calculation means for calculating a mode control value concerned in the control of the discharge mode, based on at least the detected representative vehicle compartment temperature and the setting vehicle compartment temperature;

(g) correction means for correcting a changeover criterion based on at least the detected upper-part temperature and the setting upper-part temperature until a deviation of the detected upper-part temperature from the setting upper-part temperature is canceled out;

(h) discharge mode selection means for selecting a discharge mode corresponding to the mode control value, based on the changeover criterion corrected by said correction means; and

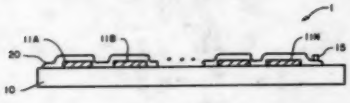
(i) drive control means for controlling the operation of said mode doors depending on the result of selection by said discharge mode selection means.

4,962,303

INFRARED IMAGE DETECTOR UTILIZING SCHOTTKY BARRIER JUNCTIONS

Tak-Kin Chu, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 27, 1989, Ser. No. 371,884
Int. Cl.[5] H01J *40/14*; G01J *5/20*; H01L *27/14*
U.S. Cl. 250—208.1 **14 Claims**



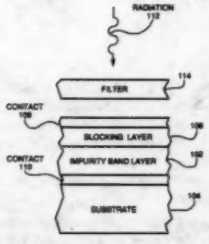
1. An infrared image detector comprising:
(a) an infrared light transparent substrate;
(b) a plurality of optically responsive materials deposited in a non-contiguous plane on one side of said substrate; and
(c) at least one contiguous metal semiconductor contact deposited on said one side of said substrate and on a portion of said plurality of optically responsive materials wherein an infrared detector element is formed wherever said metal contact crosses one of said plurality of optically responsive materials and wherein said metal contact is a single ohmic connection point for each of said formed detector elements and each of said plurality of optically responsive materials crossed by said contiguous metal contact is a non-ohmic, Schottky barrier connection point.

4,962,304

INTRINSIC IMPURITY BAND CONDUCTION DETECTORS

Maryn G. Stapelbroek, Santa Ana; Michael D. Petroff, Fullerton, and Ramasesha Bharat, Orange, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 23, 1988, Ser. No. 289,133
Int. Cl.[5] H01J *40/14*; H01L *29/12*
U.S. Cl. 250—211 J **13 Claims**



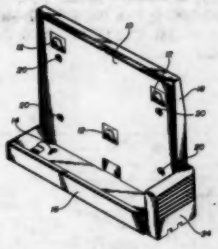
1. A method of detecting electromagnetic energy by the generation of intrinsic charge carriers, comprising the steps of:
providing an extrinsic impurity-band semiconducting region with a first conductivity type impurity concentration which is high enough to create an impurity energy band;
providing an intrinsic semiconducting blocking region with first and second conductivity type impurity concentrations which are low enough that substantially no charge transport occurs by an impurity conduction mechanism;
applying an electrical potential to the impurity-band and blocking regions to create an electric field across the regions;
exposing the regions to the electromagnetic energy to generate intrinsic charge carriers in the regions; and
sensing the electrical current induced in the regions as a result of the intrinsic charge carrier generation.

4,962,305

MOUNTING ARRANGEMENT FOR VERTICALLY MOUNTING A SCANNER

Theodore H. Schorr, Eugene, Oreg., assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Jul. 31, 1989, Ser. No. 387,349
Int. Cl.[5] G06K *9/00*
U.S. Cl. 250—239 **14 Claims**



1. A mounting arrangement for vertically mounting a scanner of the type which projects a laser light beam in a scan pattern to find a label on a package and read symbols thereon, said scanner having a housing, a window positioned on a first side of the scanner housing, power and communication cables emerging from a lateral side of said housing, and an optical system within the housing to project the beam through the window, comprising:
a support plate for engaging a second side of the scanner housing opposite said first side, said support plate including means for securing said plate to a horizontal surface,
a back cover for covering the side of said support plate on the side thereof opposite said scanner, and
a cable cover, securable to said support plate and to said back cover, for covering said cables emerging from said lateral side of said housing.

4,962,306

MAGNETICALLY FILTERED LOW LOSS SCANNING ELECTRON MICROSCOPY

Rodney T. Hodgson, Ossining; Francoise K. LeGoues, Peekskill, and Oliver C. Wells, Yorktown Heights, all of N.Y., assignors to Intenational Business Machines Corporation, Armonk, N.Y.

Filed Dec. 4, 1989, Ser. No. 444,926
Int. Cl.[5] H01J *37/244*
U.S. Cl. 250—310 **46 Claims**

1. An electron apparatus including, in combination:
means for producing an electron beam,
means for directing said beam to a sample to be examined,

means for producing a magnetic field in which said sample is immersed, and

a detector for detecting electrons scattered from said sample, said detector being located in said magnetic field at a location such that only low-loss electrons scattered from said sample reach said detector.

4,962,307

CORONA DISCHARGING DEVICE

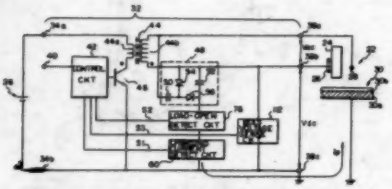
Masahide Nakaya, Chigasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 19, 1989, Ser. No. 340,534

Claims priority, application Japan, Apr. 21, 1988, 63-98697; Apr. 21, 1988, 63-98698; Feb. 25, 1989, 1-44641

Int. Cl.[5] H01T *19/00*

U.S. Cl. 250—324 **10 Claims**



1. A corona discharging device for image forming equipment having an image carrier, comprising:

a corona discharger located in close proximity to said image carrier and comprising a dielectric plate, a rear electrode positioned at one side of said dielectric plate, and a corona wire positioned at the other side of said dielectric plate; and

a high-tension power supply for applying a DC bias voltage across said rear electrode and said image carrier and applying a pulse voltage which is opposite in polarity to the DC bias voltage across said rear electrode and said corona wire.

4,962,308

CHARGED PARTICLE APPARATUS COMPRISING A BEAM DISCRIMINATOR

Bernardus J. M. Bormans, and Johan G. Bakker, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 8, 1988, Ser. No. 229,591

Claims priority, application Netherlands, Aug. 10, 1987, 8701871

Int. Cl.[5] H01J *37/147*

U.S. Cl. 250—396 R **11 Claims**

1. A beam apparatus of charged particles comprising

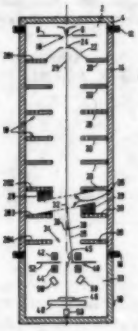
(a) source means for generating a beam of charged particles along a beam axis, said charged particles being both electrons and ions,

(b) a multiple number of sequentially disposed electrode means for collimating and accelerating said charged particle beam, said sequentially disposed electrode means being disposed along said beam axis,

(c) means disposed toward an exit of said multiple number of electrode means for spatially separating said electrons and ions in said charged particle beam by deflection from said beam axis,

said means including an electrostatic deflection device and a magnetic deflection device cooperating therewith to separate said electrons and said ions, said means directing either one of said electrons or said ions to an object to be irradiated,

wherein said electrostatic deflection device includes at least a pair of tilted electrodes of said multiple number of elec-



trode means, said tilted electrodes being tilted from said beam axis.

4,962,309

MAGNETIC OPTICS ADAPTIVE TECHNIQUE

Frederic H. White, III, Poway; Patrick H. Hu, Thousand Oaks, and Jerry R. Bettis, Simi Valley, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 21, 1989, Ser. No. 396,192

Int. Cl.[5] H01J *3/00*

U.S. Cl. 250—396 R **20 Claims**

1. A magnetic optics adaptive technique for focusing charged particle beams comprising

a lens having a circumference and a length and having a plurality of poles, evenly spaced, around the circumference of the lens,

a means of controlling the intensity of the field lines in each pole separately,

a means of tagging each pole so the effects of each pole may be separately detected in a charged particle beam.

4,962,310

RADIANT UNIT

Udo Hennecke, Alzenau, and Ralf Schönfelder, Bruchköbel, both of Fed. Rep. of Germany, assignors to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

Filed Mar. 20, 1989, Ser. No. 325,733

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1988, 3823512

Int. Cl.[5] H04B *10/00*

U.S. Cl. 250—494.1 **6 Claims**

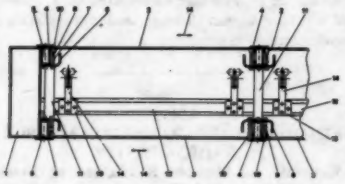
1. Radiant unit in the form of a plate like assembly comprising

a supporting frame comprising holding means for accommodating a plurality of radiant lamps, said frame having

openings at each of two opposed sides and a pair of abutments associated with each opening,

a cover located in each of said openings, each cover having opposed ends, one of said covers being permeable to radiation, each cover having an inward surface and an outward surface located against said abutments at opposed ends;

a pair of spring loaded clamps associated with each opening



to hold the respective cover against the abutments, each clamp comprising a bracket fixed to said frame, a bolt passing through said bracket and extending perpendicularly toward an end of the inward surface of the cover, a cleat fixed to the end of the bolt against the cover, and a compressed spring between the bracket and the cleat, whereby,

each said cover is spring loaded against the abutments of the frame, and may be released by bearing against the cover.

4,962,311

DEVICE FOR DETERMINING THE DIRECTION OF INCIDENT LASER RADIATION

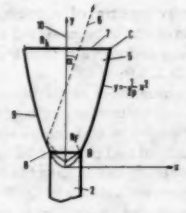
Hans Poisel, Dachau; Martina Schreiber, and Gerd Trommer, both of Munich, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-blohm GmbH, Munich, Fed. Rep. of Germany

Filed May 11, 1989, Ser. No. 350,719

Claims priority, application Fed. Rep. of Germany, May 28, 1988, 3818229

Int. Cl.[5] G01B *11/26*

U.S. Cl. 250—216 **3 Claims**



1. A detector device for the directionalized detection of laser radiation including a plurality of individual optical detectors which measure radiation throughout a defined total angle of detection, wherein the angle of detection of adjacent individual optical detectors overlap each other, and wherein each individual optical detector comprises a fiber optic guide optically coupled to a corresponding light concentrator, which concentrator has a generally funnel-shaped, dynamically balanced design, including a funnel wall tapered towards the end of the fiber optic guide, and wherein the funnel wall has a reflecting surface and is formed such that the following condition is fulfilled:

$$A_k \sin^2\theta_{max} > A_F \sin^2\theta_g$$

wherein: A_k is the surface area of the light-receiving aperture of the light concentrator, A_F is the surface area of the fiber optic guide, θ_{max} is the maximum acceptance angle of the individual optical detector, and θ_g is the fiber acceptance angle, defined by the numerical aperture $A_n = \sin\theta_g$ of the fiber optic guide.

4,962,312

LASER BEAM SCANNING DEVICE WITH PLURAL SOURCES AND SOURCE-SENSITIVE SYNCHRONIZATION

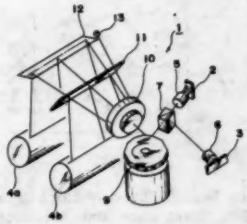
Kazuo Matsuura; Hitoshi Sekino; Keizo Nishiguchi, and Narutaka Yoshida, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 19, 1989, Ser. No. 409,101

Claims priority, application Japan, Sep. 20, 1988, 63-235863

Int. Cl.[5] H01J *3/14*

U.S. Cl. 250—236 **13 Claims**



1. A laser beam scanning device comprising:

a plurality of laser beam sources for emitting laser beams having properties different from each other, respectively such that each of the laser beams is modulated by an image signal;

a deflection means for simultaneously deflecting the laser beams emitted by said laser beam sources;

a light detecting means for detecting one of the laser beams such that modulation of the laser beams emitted by said laser beam sources is started in response to a signal outputted from said light detecting means; and

an optical member which is disposed on an optical path from said deflection means to said light detecting means and optically selects only the one of the laser beams so as to irradiate the one of the laser beams onto said light detecting means.

4,962,313

WIEN-TYPE IMAGING CORRECTOR FOR AN ELECTRON MICROSCOPE

Harald Rose, Darmstadt, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Fed. Rep. of Germany

Filed Dec. 11, 1989, Ser. No. 448,270

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1988, 3841715

Int. Cl.[5] G21K *1/08*

U.S. Cl. 250—311 **11 Claims**

1. An imaging corrector of the Wien type for an electron microscope having an electron-optical system defining an optical axis and having an objective lens and an image-transmitting lens arranged on said axis, the objective lens defining a first intermediate image plane transverse to said axis and said image-transmitting lens defining a third intermediate image plane also transverse to said axis, and said first and third image planes being disposed between said lenses in spaced relationship to each other, said corrector being arranged between said lenses and comprising:

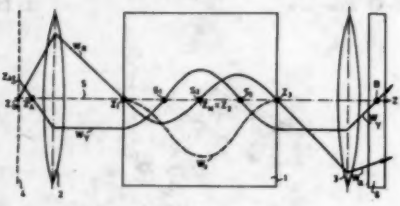
forward and rearward ends disposed on said first and third intermediate image planes, respectively;

said electron-optical system defining a second intermediate

image plane (Z_2) and said corrector having a center coincident with said second intermediate image plane (Z_2);

said corrector being built into said electron-optical system and defining first and third symmetry planes (S_1, S_3) on respective sides of said third intermediate image plane (Z_2);

at least eight electrodes and at least eight magnetic poles for generating electrical and magnetic correcting fields for causing rays W_y entering said corrector parallel to said axis to trace a path through said corrector which is mirror symmetrical with respect to said second intermediate image plane (Z_2) and which intersects said axis within said corrector at first and third intersect points lying in said symmetry planes (S_1, S_3), respectively;



said corrector having a first corrector half between said first intermediate image plane and said second intermediate image plane (Z_2) and containing said first symmetry plane (S_1);

said corrector having a second corrector half between said third intermediate image plane and said second intermediate image plane (Z_2) and containing said second symmetry plane (S_3);

said path being point symmetrical with respect to said first intersect point and referred to said axis in said first corrector half; and,

said path being point symmetrical with respect to said second intersect point and referred to said axis in said second corrector half.

4,962,314

IMAGE TRANSFER APPARATUS

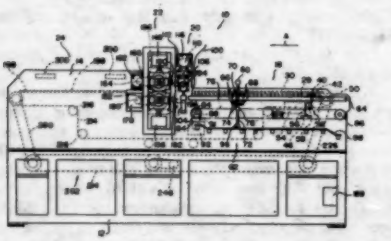
Kiyoshi Hirota, and Hirokazu Kato, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 25, 1989, Ser. No. 384,951

Claims priority, application Japan, Jul. 26, 1988, 63-98641[U]; Jul. 26, 1988, 63-98643[U]; Jul. 26, 1988, 63-185997; Aug. 19, 1988, 63-108949[U]; Oct. 6, 1988, 63-252498; Apr. 19, 1989, 1-99609

Int. Cl.[5] G03C *5/16*

U.S. Cl. 250—318 **24 Claims**



1. An image transfer apparatus for transferring an image on an image sheet to an image-receiving sheet, comprising:

a working station for placing said image sheet and said image-receiving sheet one above the other on a support member to make up a transported sheet assembly;

a tacking station for tentatively securing said image sheet and said image-receiving sheet of said transported sheet assembly together;

a transfer station for applying either pressure or pressure and heat to said transported sheet assembly tentatively secured in said tacking station, thereby to transfer said image to said image-receiving sheet; and

feed means for feeding said transported sheet assembly from said working station through said tacking station to said transfer station in sequence.

4,962,315

METHOD AND APPARATUS FOR MEASURING RADIOACTIVITY

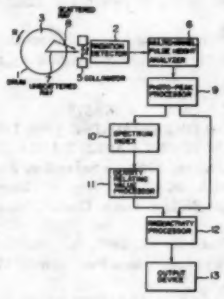
Satoru Kawasaki, and Masahiro Kondo, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 28, 1988, Ser. No. 291,159

Claims priority, application Japan, Dec. 29, 1987, 62-334101

Int. Cl.[5] G01T *1/167*

U.S. Cl. 250—336.1 **9 Claims**



1. A radioactivity measuring method, comprising the steps of:

determining energy spectra of radiation rays which are emitted from an object to be measured and are detected by a radiation sensor through a collimator arranged in front of a radiation detector;

calculating a spectrum index on the basis of an intensity of scattered rays and an intensity of unscattered rays determined by distribution of said energy spectra;

calculating a density of said object to be measured or a value relating to said density of the object to be measured on the basis of said spectrum index; and

metering radioactivity of said object to be measured on the basis of said value relating to the density and said intensity of the scattered rays.

4,962,316

FREQUENCY DOMAIN INTEGRATING RESONANT SUPERCONDUCTING TRANSMISSION LINE DETECTOR

Michael D. Jack, Goleta, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

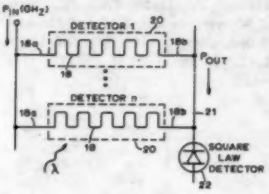
Filed Jul. 31, 1989, Ser. No. 387,209

Int. Cl.[5] H01L *39/00*

U.S. Cl. 250—336.2 **24 Claims**

1. A radiation detector comprising a superconducting transmission line means having an input port for coupling to a frequency signal and an output port for coupling to sensor

means for detecting a variation in the frequency signal, said transmission line means being responsive to incident radiation



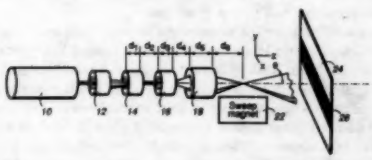
for having induced therein a change in a resonant frequency of said transmission line means.

4,962,317

CONFINED ENERGY DISTRIBUTION FOR CHARGED PARTICLE BEAMS

Andrew J. Jason, and Barbara Blind, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 29, 1989, Ser. No. 414,232
Int. Cl.[5] H01J *37/141*
U.S. Cl. 250—396 ML **8 Claims**



1. Optics for manipulating a charged particle beam from a linear accelerator in at least one dimension for impacting a target, comprising:

first linear optics for inputting said beam and outputting a first beam forming a beam waist in a first dimension which is small relative to a second dimension normal to said first dimension,

first nonlinear optics for receiving said first beam at about said first beam waist and outputting a second beam having a phase-space distribution effective to fold edge portions of said beam along said second dimension toward a core region of said beam wherein said beam is well-contained with an area of relatively uniform intensity along said second dimension at a determinable distance from said first nonlinear optics;

second linear optics for inputting said second beam and outputting a third beam defining a second beam waist along said second dimension which is small relative to said first dimension, and

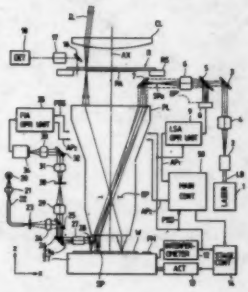
second nonlinear optics for receiving said third beam at about said second beam waist and outputting a fourth beam having a phase space distribution effective to fold edge portions of said beam along said first dimension toward a core region of said beam wherein said beam is well-contained in both said first and second dimensions at said determinable distance.

4,962,318

ALIGNMENT SYSTEM FOR EXPOSURE APPARATUS

Kenji Nishi, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Aug. 17, 1989, Ser. No. 395,078
Claims priority, application Japan, Aug. 19, 1988, 63-205770
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—548 **4 Claims**



1. An exposure apparatus for transferring a mask pattern to a wafer having a surface photoresist layer sensitive to a predetermined wavelength range, comprising:

first mark position detection means for illuminating said wafer with single wavelength or quasi monochromatic light as first light, detecting a first mark on said wafer illuminated by said first light and providing first position data concerning the position of said first mark according to the result of said first mark detection;

second mark position detection means for illuminating said wafer with light having a wider wavelength distribution than said first light as second light, detecting a second mark on said wafer illuminated by said second light and providing second position data concerning the position of said second mark according to the result of said second mark detection; and

position determination means for determining relative positions of said wafer and said mark according to both said first and second position data.

4,962,319

REMOTE SUBSURFACE WATER TEMPERATURE MEASURING APPARATUS WITH BRILLOUIN SCATTERING

Donald A. Leonard, Cupertino, and Harold E. Sweeney, Menlo Park, both of Calif., assignors to GTE Government Systems Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 386,383, Jul. 28, 1989. This application Aug. 29, 1989, Ser. No. 400,217
Int. Cl.[5] G01N *15/06*; G01J *5/00*; G01B *9/02*
U.S. Cl. 250—574 **9 Claims**

1. Apparatus for remotely measuring the unknown temperature T_r of a transparent medium, comprising:

first laser means generating a continuous laser beam having a λ_1 wavelength;

second laser means generating a pulsed laser beam having a λ_1 wavelength and having an irradiance such that

$I \geq 30/GL$ where,

G is a gain parameter of said transparent medium (m/W),

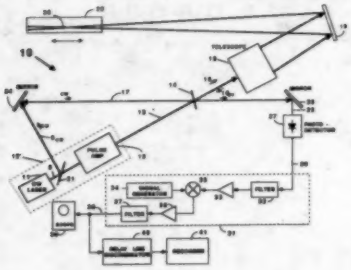
I is the intensity of said pulsed laser beam, (W/m^2), and

L is the interaction length (m),

means for directing said pulsed laser beam into said medium to produce stimulated Brillouin scattering and thereby causing a phase-conjugate (pc) beam to emanate therefrom;

a photodetector for receiving said continuous laser beam;

means for directing said phase-conjugate beam to said photodetector for mixing with said continuous laser beam and thereby producing a nonoptical difference frequency proportional to the temperature T_s; and



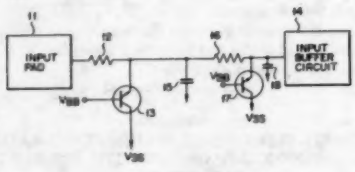
means for converting said difference frequency into a temperature value.

4,962,320

INPUT PROTECTION CIRCUIT FOR MOS DEVICE

Yoshio Okada, Tokyo; Sadao Imada, Yokohama, and Mitsuru Shimizu, Chiba, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 13, 1989, Ser. No. 379,279
Claims priority, application Japan, Jul. 29, 1988, 63-190251
Int. Cl.[5] H02H *3/20*
U.S. Cl. 361—56 **5 Claims**



1. An input protection circuit for a MOS device with an input pad and an input buffer circuit, comprising:

a first resistor having a first end connected to the input pad, and a second end;

a first clamp element connected to the second end of the first resistor;

a first connection line having a first end connected to the second end of the first resistor, the first connection line also having a second end and a first capacitance;

a second resistor having a first end connected to the second end of the first connection line, the second resistor also having a second end and a resistance greater than the resistance of the first resistor;

a second clamp element connected to the second end of the second resistor; and

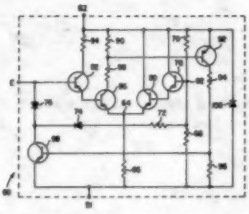
a second connection line having a first end connected to the second end of the second resistor, the second connection line also having a second end connected to the input buffer circuit and a second capacitance less than the first capacitance of the first connection line.

4,962,321

THREE TERMINAL REPLACEMENT FOR UNIJUNCTION TRANSISTOR

Charles M. Hansen, Jr., Tinton Falls, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed May 10, 1989, Ser. No. 349,745
Int. Cl.[5] H03K *3/313, 3/351, 17/30, 17/60*
U.S. Cl. 307—301 **11 Claims**



1. A circuit for replacing a UJT, comprising:

a base-one terminal, a base-two terminal and an emitter terminal;

a first and a second node each having a voltage associated therewith;

biasing means connected to said base-one terminal, said base-two terminal and said first node for determining said voltage at said first node;

a first resistor connected between said second node and said base-one terminal;

current conducting means connected to said base-two terminal, said first node and said second node for allowing current flow from said base-two terminal to said base-one terminal in accordance with said first resistor and for relating said voltage at said first node to said voltage at said second node by a fixed drop;

first switching means connected to said base-two terminal, said second node and said emitter terminal for conducting current from said base-two terminal to said second node when enabled by a voltage at said emitter terminal in relation to said voltage at said second node;

second switching means connected to said base-one terminal, said emitter terminal, said biasing means and said first switching means for conducting current from said emitter terminal to said base-one terminal when enabled and for causing said biasing means to bias said first node at a first pre-determined voltage when not enabled and at a second pre-determined voltage when enabled, said second pre-determined voltage being lower than said first pre-determined voltage, said second switching means being enabled by enablement of said first switching means;

said current conducting means including a first transistor having a base connected to said first node, an emitter connected to said second node, and a collector connected to said base-two terminal;

said first switching means including a second transistor having a base connected to said emitter terminal, an emitter connected to said second node and a collector connected to said base-two terminal in series with a second and a third resistor;

said second switching means including a third transistor having an emitter connected to said base-two terminal, a collector connected to said base-one terminal in series with a fourth and a fifth resistor and a base connected to the connection between said second and said third resistors and a fourth transistor having a base connected to the connection between said fourth and said fifth resistors, a collector connected to said emitter terminal and an emitter connected to said base-one terminal;

said biasing means including a sixth resistor connected between said first node and said base-two terminal, a seventh resistor connected from said first node to said base-one

terminal and an eighth resistor connected from said first node to said emitter terminal;

a first diode in series between said emitter terminal and said collector of said fourth transistor and having an anode connected to said emitter terminal and a cathode connected to said collector of said fourth transistor; and

a second diode in series between said eighth resistor and said collector of said fourth transistor and having an anode connected to said eighth resistor and a cathode connected to said collector of said fourth transistor.

4,962,322

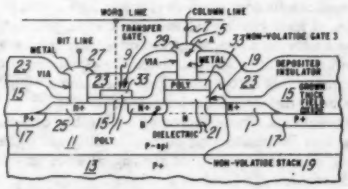
NONVOLATIBLE CAPACITOR RANDOM ACCESS MEMORY

Richard A. Chapman, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 283,039, Dec. 5, 1988, abandoned, which is a continuation of Ser. No. 755,232, Jul. 15, 1985, abandoned. This application Oct. 25, 1989, Ser. No. 426,520

Int. Cl.[5] H03K *3/353;* **H01L** *29/78, 27/02;* **G11C** *11/40*

U.S. Cl. 307—304 **18 Claims**



1. A DRAM cell having:

(a) a storage gate,

(b) a nonvolatile dielectric stack under and contiguous to said storage gate for storing electrical charge,

(c) a region of semiconductor material spaced from said storage gate having a heavily doped n+-type annular region therein, said storage gate disposed over the central portion of said annular region and extending over a portion of said annular region, said n+-type region having a doping concentration in the range from about 1×10^{18} ions/cc to about 1×10^{21} ions/cc and an n-type tank has a doping concentration in the range from about 1×10^{15} ions/cc to about 1×10^{16} ions/cc, and

(d) said n-type tank disposed in said region of semiconductor material beneath and contiguous to said nonvolatile dielectric stack and electrically coupled to and within said central portion of said annular region.

4,962,323

HIGH SPEED AUTO ZERO COMPARATOR

Paul D. Ta, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 12, 1989, Ser. No. 379,577

Int. Cl.[5] H03K *5/24*

U.S. Cl. 307—350 **4 Claims**

1. A comparator circuit comprising:

a first voltage supply terminal;

a second voltage supply terminal;

a first current source having a current source terminal referenced to said second voltage supply;

an inverting input leg comprising:

an inverting input transistor having an inverting input lead, a first current handling terminal connected to said current source terminal, and a second current handling terminal serving as a non-inverting output terminal; and

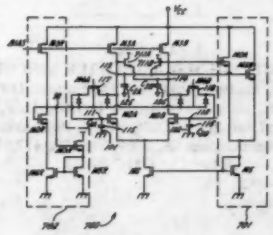
a first load device connected between said first voltage supply terminal and said second current handling terminal of said inverting input transistor;

a non-inverting input leg comprising:

a non-inverting input transistor having a non-inverting input lead, a first current handling terminal connected to said current source terminal, and a second current handling terminal serving as an inverting output terminal; and

a second load device connected between said first voltage supply terminal and said second current handling terminal of said non-inverting input transistor;

a first transmission gate comprising a first MOS transistor having a first current handling terminal connected to said inverting input lead, a second current handling terminal connected to said non-inverting output lead, a control terminal for receiving a control signal defining when said first MOS transistor is to be turned on, and a bulk terminal connected to the bulk of said first MOS transistor;



a second transmission gate comprising a second MOS transistor having a first current handling terminal connected to said non-inverting input lead, a second current handling terminal connected to said inverting output lead, a control terminal for receiving a control signal defining when said second MOS transistor is to be turned on, and a bulk terminal connected to the bulk of said second MOS transistor; and

replica biaz means for providing a replica bias voltage to said first and second bulk terminals, said replica bias voltage being substantially equal to the voltage on said inverting and non-inverting input leads when said first and second transmission gates are conducting.

4,962,324

EQUALIZING CIRCUIT FOR A SENSE AMPLIFIER

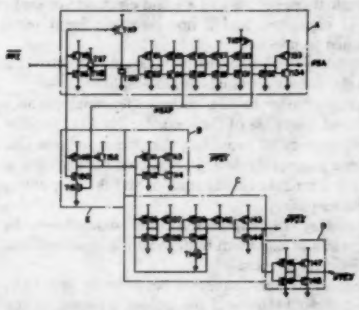
Hee-Choul Park, Seoul, Rep. of Korea, assignor to Samsung Electronics, Ltd., Suwon, Rep. of Korea

Filed Jan. 3, 1989, Ser. No. 292,769

Claims priority, application Rep. of Korea, Apr. 30, 1988, 88-5050

Int. Cl.[5] H03K *5/24*

U.S. Cl. 307—350 **2 Claims**



1. An equalizing circuit for a sense amplifier comprising:

a sense amplifier enable signal generation means for receiving a sense amplifier equalizing signal and for generating a sense amplifier enable signal;

an equalizing control means for receiving both said sence amplifier equalizing signal and said sense amplifier enable signal for generating an equalizing control output signal therefrom;

a first equalizing signal generation means for receiving said equalizing control output signal for generating a first sense amplifier equalizing signal;

a second equalizing signal generation means for receiving said equalizing control output signal for generating a second sense amplifier equalizing signal; and

a third equalizing signal generation means for receiving said second sense amplifier equalizing signal for generating a third amplifier equalizing signal.

4,962,325

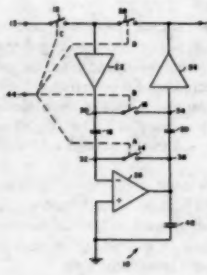
SAMPLE-HOLD AMPLIFIER CIRCUIT

Gerald Miller, Hudson, N.H., and Christopher O'Connor, Methuen, Mass., assignors to Analog Devices, Inc.

Continuation of Ser. No. 242,886, Sep. 9, 1988, abandoned. This application Sep. 26, 1989, Ser. No. 412,599

Int. Cl.[5] G11C *27/02*

U.S. Cl. 307—353 **10 Claims**



1. A sample-hold amplifier circuit for sampling a voltage applied to an input of the circuit and for selectively holding the sampled input voltage to provide the same to an output of the circuit, said circuit comprising:

an input buffer, having an output terminal, and an input terminal attached to said input of the circuit, for driving said input voltage to the remainder of the circuit;

a primary hold capacitor, having a first electrode connected to the output terminal of said input buffer, for storage of said sampled input voltage;

an amplifier, having an output terminal, an inverted input terminal connected to a second electrode of said primary hold capacitor, and a non-inverting input terminal attached to ground;

a secondary hold capacitor having a first electrode attached to the output terminal of said amplifier;

an output buffer having an input terminal connected to a second electrode of the secondary hold capacitor, and an output terminal providing the output for said circuit;

a primary sampling switch connected between the inverting input terminal of said amplifier and the output terminal of said amplifier;

a secondary sampling switch connected between the output terminal of said input buffer and the input terminal of said output buffer; and

a feedback switch connected between the input terminal of said input buffer and the output terminal of the output buffer.

4,962,326

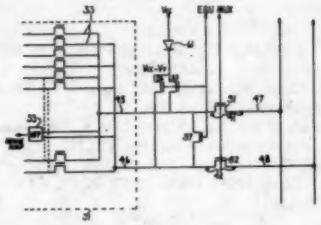
REDUCED LATCHUP IN PRECHARGING I/O LINES TO SENSE AMP SIGNAL LEVELS

Ward D. Parkinson, and Wen-Foo Chern, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Jul. 22, 1988, Ser. No. 222,842

Int. Cl.[5] H03K *17/16, 19/003*

U.S. Cl. 307—443 **14 Claims**



1. In a semiconductor circuit device having a signal generating source, at least two signal lines which are precharged to signal sensing levels, a precharge circuit which precharges the signal lines, an equilization transistor for equalizing the precharge signal levels across the signal lines, and a signal level voltage source, the circuit device comprising:

(a) the precharge circuit including a plurality of precharge transistors for conducting current to different signal lines during said precharging of the signal lines in order to precharge voltage levels;

(b) a junction device interposed between the signal level voltage source and the precharge transistors so that when the signal lines are being precharged, the current for precharging the signal lines passes through said junction device;

(c) the junction device having a threshold voltage which is substantially equivalent to a desired voltage drop from signal level voltage to the precharge voltage levels, thereby lowering forward bias of the precharge transistors by providing a precharge which is at a threshold voltage below bias voltage, and reducing distortion in signal levels of the signal lines when voltage at the signal level voltage source "bumps" downward by permitting the allowed range of power supply voltage bumping to be increased by and amount equal to said threshold voltage.

4,962,327

DECODER CIRCUIT HAVING SELECTIVE TRANSFER CIRCUIT FOR DECODED OUTPUT SIGNAL

Tomonobu Iwazaki, Yamato, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 31, 1989, Ser. No. 304,259

Claims priority, application Japan, Feb. 2, 1988, 63-022285

Int. Cl.[5] H03K *19/096*

U.S. Cl. 307—449 **16 Claims**

1. A decoder circuit responsive to a set of input signals for producing a decoded output signal during a related timing interval, comprising:

a plurality of signal conductors;

timing means producing a timing output defining a succession of alternate first and second timing intervals;

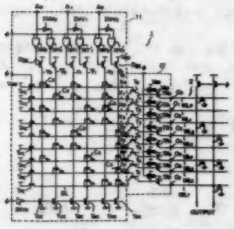
a first potential setting means connected to said signal conductors and responsive to the timing output for setting the potential of each of said signal conductors to a first potential, in a first timing interval;

a second potential setting means connected to said signal conductors and responsive to the timing output of said timing means and to a set of input signals for selecting one of said signal conductors, and for maintaining the potential of the selected signal conductor at said first potential

and reducing the potential of the remaining said signal conductors to a second potential, in a second timing interval;

a plurality of transfer transistors respectively associated with said plurality of signal conductors, each said transfer transistor having a gate electrode, a source electrode, and a drain electrode;

the gate electrode of each said transfer transistor being connected to the respectively associated signal conductor, and the source electrode of each said transfer transistor being connected to a related one of said plurality of signal conductors other than the respectively associated signal



conductor connected to the gate electrode thereof, the potential levels of the gate and source electrodes of each said transfer transistor thereby being established by the potential levels of the corresponding, said respectively associated and related signal conductors; and

the transfer transistor respectively associated with the selected signal conductor being switched ON by the first potential of the selected and respectively associated signal conductor as applied to the gate electrode thereof and the second potential of the related signal conductor as applied to the source electrode thereof and producing a decoded output signal, during the second timing interval.

4,962,328

CHARGE AMPLIFIER CIRCUIT WITH DRIFT COMPENSATION

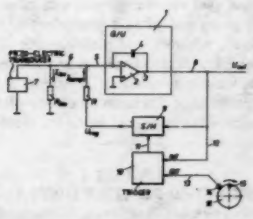
Gerhard Wiles, and Klaus Leitmeier, both of Graz, Austria, assignors to AVL Gesellschaft fiir Verbrennungskraftmaschinen und Messtechnik mbH., Prof.Dr.Dr.h.c. Hans List, Austria

Filed Jan. 25, 1989, Ser. No. 301,086

Claims priority, application Austria, Jan. 25, 1988, 132/88

Int. Cl.[5] H03F *1/30, 1/02*

U.S. Cl. 307—491 **11 Claims**



1. In a charge amplifier circuit, wherein an output of the amplifier is fed back through a drift compensating device, the drift compensating device being connected to a trigger device which directs a trigger signal to the drift compensating device to cause the drift compensating device to generate a compensating current corresponding to drifting of an output signal of the amplifier, the compensating current being directed to an input of the amplifier, the improvement comprising:

the drift compensating device including a sample/hold unit coupled to the trigger device and the output of the amplifier so that the drift is compensated according to drift values sampled between periodically occurring signals amplified by the amplifier, the trigger device supplying trigger signals to the sample/hold unit to trigger sampling by the sample/hold unit, the trigger device being provided with an external triggering arrangement that includes at least one signal generator which produces primary trigger signals associated with the occurrence of processes giving rise to the periodically occurring signals, the signal generator being connected to a signal selection circuit in the trigger device, which, by picking out every n'th signal, generates the trigger signal sequence directed to the sample/hold unit for forming sample pulses.

4,962,329

SPIRALLY LAYERED AND ALIGNED PRINTED-CIRCUIT ARMATURE COIL

Masahiko Fujita; Yuuji Shishido; Yuzuru Suzuki, and Masato Okamoto, all of Iwata, Japan, assignors to Minebea Co., Ltd., Japan

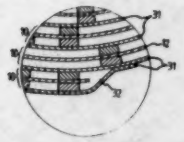
PCT No. PCT/JP88/00772, § 371 Date Mar. 21, 1989, § 102(e) Date Mar. 21, 1989, PCT Pub. No. WO89/01258, PCT Pub. Date Feb. 9, 1989

PCT Filed Aug. 2, 1988, Ser. No. 332,931

Claims priority, application Japan, Aug. 3, 1987, 62-194014; Jul. 16, 1988, 63-177588

Int. Cl.[5] H02K *5/128, 21/22;* **H01F** *5/06*

U.S. Cl. 310—208 **1 Claim**



1. In an armature coil wherein a plurality of sets of unit coil groups, each comprising an even number of unit coils, are printed and arranged on a belt-like, thin and pliable insulating material to form a printed coil, and said printed coil is wound and fixed together with a pliable insulating material layer overlaid over the printed coil into a cylindrical shape, the improvement comprising a gap between adjacent conductors of the unit coil groups located on the outer periphery side of said cylindrical shape being set larger than the gap between adjacent conductors of the unit coil groups located on the inner periphery side thereof such that the conductors of respective unit coils are axially arranged to take the same angle in the circumferential direction; and

an adhesive thermostatic layer being formed on both surfaces of the insulating material layer, and between the printed coil and the insulating material layer for fixing the printed coil and insulating material layer in the cylindrical shape.

4,962,330

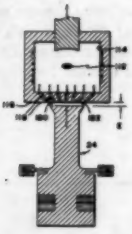
ACOUSTIC TRANSDUCER APPARATUS WITH REDUCED THERMAL CONDUCTION

Ernst G. Lierke, Schwalbach/Taunus, Fed. Rep. of Germany; Emily W. Leung, La Canada, and Balakrishna T. Bhat, Altadena, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 21, 1989, Ser. No. 326,756

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—323 **5 Claims**



1. Apparatus for levitating an object and establishing it at a high temperature, comprising:

walls forming a chamber with an inside surface;

means for applying heat to an object lying in said chamber;

a sound-producing transducer;

a horn having a rearward portion coupled to said transducer and a forward portion coupled to said

chamber to apply sound energy thereto;

said chamber walls including a perforated wall with a plurality of holes;

said horn having an extreme forward end facing said perforated wall but spaced therefrom.

4,962,331

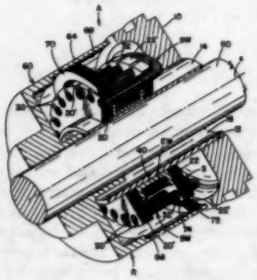
ROTATABLE CONTROL SIGNAL GENERATOR

Charles S. Smith, Pompton Plains, N.J., assignor to Servo-Tek Products Company, Inc., Hawthorne, N.J.

Filed Jul. 13, 1989, Ser. No. 379,634

Int. Cl.[5] H02K *19/24*; H01F *21/06*; H02P *9/02*

U.S. Cl. 310—261 **53 Claims**



42. In a resolver of the type having a stator including means forming two axially spaced, concentric pole surfaces with a number of circumferentially spaced pairs of axially spaced coil receiving slots, one slot of each pair being in one of said pole surfaces, a multiturn ac primary exciter winding between and wound concentric with said pole pieces and first and second positionally offset sensing windings mounted on said pole pieces as a number of individual series connected coils wound between spaced pairs of said aligned pairs of slots; and, said resolver having a rotor with a flux concentrator ring formed with axially offset portions, whereby rotation of said ring with respect to said pole pieces alternates the flux field between said spaced pole pieces, the improvement comprising: each of said first and second sensing windings are formed from a number of individual coils wound between two sets of slots in said pole pieces, with said individual coils each having equal slot pitch and a variable number of turns selected to produce a generally sinusoidal output wave form for said sensing winding.

4,962,332

ULTRASONIC PROBE AND METHOD OF MANUFACTURING THE SAME

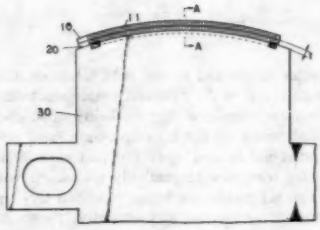
Haruyasu Rokurohta, and Kazufumi Ishiyama, both of Otawara, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 157,785, Feb. 19, 1988, abandoned. This application Nov. 1, 1989, Ser. No. 430,104

Claims priority, application Japan, Feb. 24, 1987, 62-39158

Int. Cl.[5] H01L *41/04*

U.S. Cl. 73—632 **4 Claims**



1. An ultrasonic probe comprising:

an ultrasonic absorbing member of thick plate having an arcuate surface;

a piezoelectric vibrator having a plurality of divided piezoelectric vibrator pieces arranged in an arcuate array on the arcuate surface of said ultrasonic absorbing member;

a main electrode of thin plate having an arcuate shaped end matching the arcuate shape of said arcuate array and formed with electrode patterns corresponding in number to said piezoelectric vibrator pieces and arranged on both sides of said ultrasonic absorbing member; and,

an arcuate auxiliary electrode plate having a plurality of divided electrode pieces wherein a width of said divided electrode pieces corresponds to the thickness of said main electrode plate, formed with electrode patterns corresponding to the electrode patterns of the main electrode plate, interposed between said piezoelectric vibrator arcuate array and said arcuate shaped end of said main electrode plate at an end of said piezoelectric pieces of said vibrator array, wherein said piezoelectric vibrator pieces and said auxiliary electrode pieces are in direct contacting connection, said piezoelectric vibrator pieces and the electrode patterns of the main electrode plate are electrically connected through said auxiliary electrode plate.

4,962,333

COMA-CORRECTED PICTURE DISPLAY SYSTEM

Albertus A. S. Sluyterman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 10, 1989, Ser. No. 309,464

Claims priority, application Netherlands, Sep. 6, 1988, 8802194

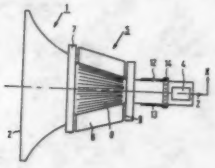
Int. Cl.[5] H01J *29/70*

U.S. Cl. 313—440 **4 Claims**

1. A picture display system comprising a colour television

display tube having a neck accommodating an electron gun assembly for generating three co-planar electron beams, and an electro-magnetic deflection unit surrounding the paths of the electron beams which have left the electron gun assembly, said deflection unit comprising

a line deflection coil of the saddle type having a front and a rear end for deflecting electron beams generated in the display tube in a horizontal direction; a yoke ring of a ferro-magnetic material surrounding the line deflection coil and having front and rear end faces extending transversely to the tube axis; and



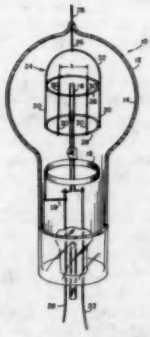
a field deflection coil comprising two diametrically arranged halves and also having a front and rear end for deflecting electron beams generated in the display tube in a vertical direction, the electron beams generated by the electron gun assemably tranversing the coils of the deflection unit in the direction from the rear ends to the front ends, characterized in that a first pair of axially extending pole shoes of a magnetizable material is arranged in the said plane symmetrically with respect to the tube axis at the rear end of the deflection unit, substantially between the rear end and the electron gun assembly, which pole shoes are magnetically coupled to each other.

4,962,334

GLOW DISCHARGE LAMP HAVING WIRE ANODE

Valery Godyak, Andover, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Mar. 27, 1989, Ser. No. 329,135
Int. Cl.[5] H01J *61/64, 17/10*
U.S. Cl. 313—619 **11 Claims**



1. A negative glow discharge lamp comprising:

a light-transmitting envelope containing a gas fill material;

a phosphor coating disposed on the inner surface of said envelope;

a cathode located within said envelope for emitting electrons;

an anode of wire located within said envelope, said wire of said anode having a thickness radius less than the electron mean free path in the discharge, said wire anode being effective in not attaining a positive anode voltage drop during operation of said lamp; and

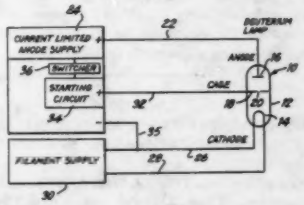
lead-in wires coupled to said cathode and anode extending through and hermetically sealed in said envelope.

4,962,335

DEUTERIUM LAMP VOLTAGE SUPPLY MEANS

Armin K. Soanenschein, 27 Natmark Ct., Woodcliff Lake, N.J. 07675

Filed Mar. 30, 1989, Ser. No. 330,778
Int. Cl.[5] H05B *41/19*
U.S. Cl. 315—335 **13 Claims**



1. In voltage supply means for a deuterium lamp having a gas-filled, enclosed envelope and at least three elements mounted in said envelope, namely, a cathode, an anode and a cage positioned between the anode and the cathode and heating means associated with the cathode, said cage having an arc defining aperture therein, there being at least four conductors extending from inside the envelope to the outside thereof, two of which are connected to the cathode heating means, one of which is a common, the third of which is connected to the anode and the fourth of which is connected to the cage, said voltage supply means having a two-terminal first output means for supplying voltage to the cathode heating means and second output means for supplying anode voltage to the anode, the improvement comprising:

a switching circuit connected between the anode and the cage;

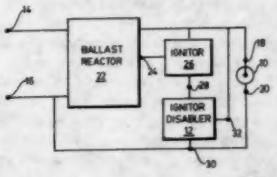
said switching circuit comprising means for applying a low positive voltage to the cage to cause an arc to strike between the cathode and the cage to initiate a plasma glow and to reduce the current to the cage as the anode glow is accelerated and the full anode current is reached.

4,962,336

IGNITOR DISABLER

Peter G. Dodd, Scarborough, and Stephen G. MacNeil, Newcastle, both of Canada, assignors to Cooper Industries, Inc., Houston, Tex.

Filed Feb. 19, 1988, Ser. No. 157,555
Claims priority, application Canada, Jan. 22, 1988, 557223
Int. Cl.[5] H05B *41/14*
U.S. Cl. 315—290 **19 Claims**



1. An ignitor disabler for use with a circuit for igniting a high intensity discharge lamp, including an ignitor portion, wherein

the lamp has a characteristic voltage which may vary during phases of lamp operation; said ignitor disabler comprising:

a) means for disabling the ignitor;

b) means for establishing a threshold voltage, which threshold voltage is higher than the characteristic voltage of the lamp under normal operating conditions;

c) triggering means for triggering the disabling means after the passage of a predetermined amount of time, the triggering means having a timing component for measuring the predetermined amount of time, which timing component begins time measuring operation only under certain predetermined conditions;

d) means for maintaining the length of the predetermined amount of time generally constant within a temperature range from at least one hundred (100° C.) degrees celsius to at least minus forty (−40° C.) degrees celcius; and

e) reset means for resetting the timing component of the triggering means upon lamp ignition.

4,962,337

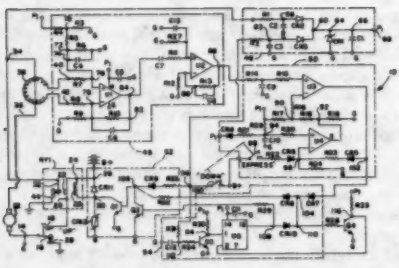
EXPRESS WINDOW LIFT MOTOR SHUTDOWN

Brian T. Creed, Batavia, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 175,819, Mar. 3, 1988, abandoned. This application Feb. 23, 1990, Ser. No. 485,809

Int. Cl.[5] E05F *15/16*; H02P *1/22*

U.S. Cl. 318—280 **5 Claims**



1. A control system for an electrically lifted vehicle door window comprising:

(a) motor means operable for forward and reverse rotation and adapted for raising and lowering a door window in a vehicle;

(b) coil means disposed adjacent a power lead of said motor means and operative to sense motor current;

(c) first circuit means receiving a signal from said coil means and operative in response thereto for switching off said motor means when said coil means senses a motor current stall condition;

(d) first switch means operable upon user actuation in one direction to a first tactilely senses position to switch power to said motor means only so long as said first switch means is held in said first position, said first switch means further actuatable in said one direction to a second tactilely sensed position;

(e) second switch means user actuatable in a direction opposite said one direction to a third position;

(f) second circuit means responsive to instantaneous actuation of said first switch means to said second position and operative thereupon to provide continuous energization of said motor means for down limit lowering of said window upon release of said instantaneous second position actuation; and,

(g) actuation of said second switch means to said third position thereupon to reverse polarity to said second circuit means to disable said continuous motor energization.

4,962,338

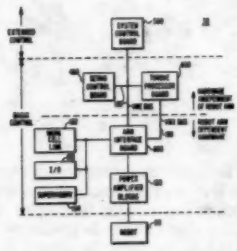
UNIVERSAL ROBOT CONTROL BOARD CONFIGURATION

Kenneth E. Daggett, Murrysville, Pa.; Eimei M. Onaga, Brookfield Center, Conn.; Richard J. Casler, Jr., Newtown, Conn.; Booth Barrett L., Brookfield, Conn., and Vincent P. Jalbert, Middlebury, Conn., assignors to Staubli International AG., Switzerland

Continuation of Ser. No. 932,982, Nov. 20, 1986, abandoned. This application Jun. 21, 1988, Ser. No. 371,668

Int. Cl.[5] B25J *13/00*

U.S. Cl. 318—568.11 **8 Claims**



1. A robot control being adaptable for variably packaged use with a relatively wide variety of robot arms, said control comprising:

a first electronic arm interface board including substantially all arm interface control circuitry, dependent on a first robot arm type to be controlled, said arm interface control circuitry including motor drive circuitry and position and velocity feedback processing circuitry for a particular robot arm;

at least a second electronic arm interface board including substantially all alternative arm interface control circuitry, dependent on a second robot arm type to be controlled, said alternative arm interface control circuitry including motor drive circuitry and position and velocity feedback circuitry for an alternative robot arm;

electronic control board means having control and resource circuitry capable of providing at least a complete basic robot control and being structured to operate substantially independently of the particular robot arm type to be controlled out of any of the different controllable robot arm types; and

interconnector means for coupling said electronic control board means with one of said arm interface boards to form an assembled control for the robot arm type associated with said one arm interface board.

6. An adaptive robot control for interfacing with a plurality of robot arms, said control comprising:

an arm interface being of the type dependent for motor drive parameters and feedback control characteristics, said interface being selected from either one of a first or a second electronic arm interface board including, respectively thereon, substantially all required arm interface circuitry, dependent on either one of a first or a second robot arm type to be controlled, said required arm interface circuitry including respective motor drive circuitry and position and velocity feedback processing circuitry for the plurality of robot arms;

electronic control board means having control and resource circuitry capable of providing at least a complete basic robot control and being structured to operate substantially independently of any particular robot arm type to be controlled for any of different controllable robot arm types; and

interconnector means for coupling said electronic control board means with one of said arm interface boards to form

an assembled control for the robot arm type associated with said one arm interface board.

7. A method for implementing robot control being adaptable for interfacing with a plurality of robot arms, said method comprising the steps of:

selecting an arm interface of the type dependent on motor drive parameters and feedback control characteristics, said selection being to either of a first or a second electronic arm interface board, basing thereon substantially all necessary arm interface control circuit functions dependent on either one of a first or a second robot arm type to be controlled, said arm type defining respective motor drive functions and position and velocity feedback processing functions unique to the particular arm type used;

assembling said selected interface board in circuit with a universal electronic control board means having control and resource circuitry, thereby providing at least a complete basic robot control while operating substantially independently of the particular robot arm type controlled for any of different controllable robot arm types; and

interconnecting sad assembly with interconnector means for coupling said electronic control board means with one of said arm interface board to form an assembled control for the robot arm type associated with said one arm interface board.

4,962,339

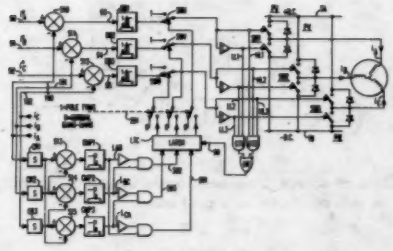
POLE-TYING CURRENT CONTROL APPARATUS

Colin D. Schauder, Murrysville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 87,939, Aug. 21, 1987, Pat. No. 4,885,518. This application Jun. 26, 1989, Ser. No. 373,018

Int. Cl.[5] H02P *5/40*

U.S. Cl. 318—798 **5 Claims**



1. In an AC motor drive including a three-phase motor, a voltage source having DC terminals of opposite polarities, an inverter connected between said DC terminals and the three phases of the motor, the inverter having three pole switches each for connecting one phase of the motor with one of said terminals, a controller for said pole switches having comparators responsive to the phase currents of the motor and to a corresponding phase current reference for establishing a switching pattern of said pole switches; the combination of:

means responsive to the status of said pole switches for detecting a concurrent switching of said motor phases with a common one of said DC terminals and for generating an enable signal;

means responsive to said motor phase currents for deriving corresponding current derivative representative phase signals;

means responsive to the difference between each of two consecutive said phase signals for selecting one of said pole switches and for generating a command signal to be applied to said selected pole switch when enabled by said enable signal;

said command signal overriding said switching pattern for connecting the motor phase corresponding to said selected pole switch to one predetermined DC terminal during at least one time interval.

4,962,340

ENGINE STARTER WITH VARIABLE LENGTH FRONT BRACKET

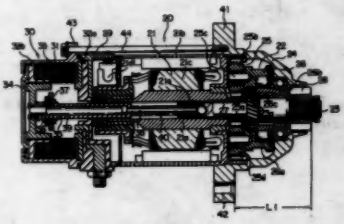
Shunzo Isozumi, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 18, 1989, Ser. No. 298,435

Claims priority, application Japan, Jan. 18, 1988, 63-9040

Int. Cl.[5] F02N *11/00*

U.S. Cl. 290—48 **3 Claims**



1. An engine starter, comprising:

a cup-shaped front bracket (24) housing an axially slidable output rotary shaft (23) having a pinion (28) on a front end thereof, and a driving force transmitting unit (22);

an electric motor (21) having a hollow cylindrical yoke (21b) fitted in a rear opening of said front bracket; and

a solenoid switch (30) mounted to a rear portion of said electric motor and having an operating rod means (35, 38) which extends through an interior of said electric motor to abut against said output rotary shaft for pushing out said output rotary shaft;

said front bracket having on an outer rear periphery thereof a mounting flange (42) having an inner diameter larger than an outer diameter of an inner gear (25*b*) of a planetary speed reduction gear of said driving force transmitting unit and larger than an outer diameter of the yoke of said electric motor.

4,962,341

LOW VOLTAGE NON-SATURATING LOGIC CIRCUIT TECHNOLOGY

John A. Schoeff, 4107 W. Jensen Rd., Cheney, Wash. 99004

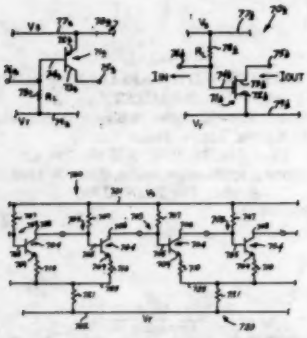
Filed Feb. 2, 1988, Ser. No. 151,423

Int. Cl.[5] H03K *19/091, 19/086, 19/09, 19/082*

U.S. Cl. 307—200.1 **26 Claims**

1. Electronic digital logic circuitry including means for conducting an approximately constant current through first and second electrically conductive power networks; a plurality of logic transistors which are electrically connected to controllably convey current between the first and second electrically conductive power networks; said plurality of logic transistors being logically connected to thus develop an approximately constant total current requirement over time for a variety of logical input and output combinations of said circuitry; means for providing an approximately constant differential voltage between the first and second electrically conduc-

tive power networks across logic units including said logic transistors to thereby provide approximately uniform biasing



of all off transistors and relatively uniform biasing of all on transistors.

4,962,342

DYNAMIC SYNAPSE FOR NEURAL NETWORK

Carver A. Mead, Pasadena; Timothy P. Allen, Palo Alto, and Federico Faggin, Los Altos Hills, all of Calif., assignors to Synaptics, Inc., San Jose, Calif.

Filed May 4, 1989, Ser. No. 347,837

Int. Cl.[5] G11C 27/02, 7/00; H03K 19/094, 19/177

U.S. Cl. 307—201 **16 Claims**

3. An adaptive amplifier, including:

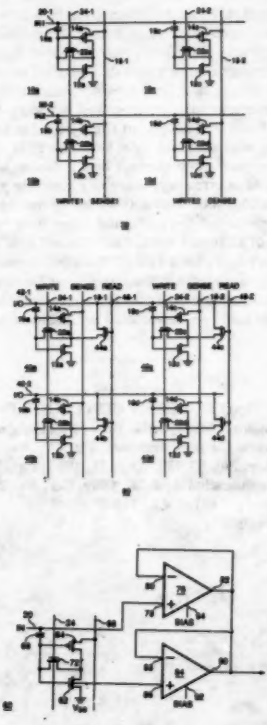
an input/output node,

an inverter including a P-channel MOS inverter transistor and an N-channel MOS inverter transistor, said P-channel MOS inverter transistor having its source connected to an output current sense node, its drain connected to the drain of said N-channel MOS inverter transistor, and a gate connected to the gate of said N-channel MOS inverter transistor, the source of said N-channel MOS inverter transistor connected to a source of negative voltage,

a capacitor connected between said input/output node and the gates of said P-channel and N-channel MOS inverter transistors,

an MOS adapt transistor, having its drain connected to the gates of said P-channel and N-channel inverter transistors, its source connected to the drains of said P-channel and N-channel inverter transistors, and its gate connected to an adapt node, and

a MOS read transistor, having its drain connected to the drains of said P-channel and N-channel inverter transis-



tors, its source connected to said input/output node, and its gate connected to a read node.

4,962,343

SIGNAL TRANSMISSION CIRCUIT

Shin-ichi Nakagawa, and Hiroyuki Kawai, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1989, Ser. No. 303,797

Claims priority, application Japan, Sep. 9, 1988, 63-226942

Int. Cl.[5] H03K 17/56, 17/16

U.S. Cl. 307—246 **8 Claims**

1. A signal transmission circuit, comprising:

a first signal transmission line connected to a first potential through a first switching element, to a second potential through a second switching element, at a one end to an input-output terminal for a receiving a signal to be transmitted, and at another end to a conduction control terminal of a third switching element such that during a first period, a precharge signal is input to said first signal transmission line to charge said first signal transmission line to said first potential;

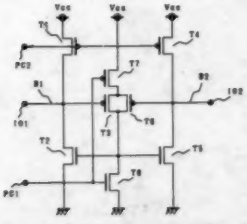
a second signal transmission line connected to the first potential through a fourth switching element, to the second potential through a fifth switching element, at a one end to an input-output terminal for a signal to be transmitted, and at an other end to a conduction control terminal of a sixth

switching element such that during said first period, a precharge signal is input to said second signal transmission line to charge said second signal transmission line to said first potential;

a seventh switching element interposed between respective one ends of said third and sixth switching elements and said first potential, wherein, when said seventh switching element conducts, the first potential is applied to said one end of said respective third and sixth switching elements;

an eighth switchsing element connected at one end to respective other ends of said respective third and sixth switching elements and to said conduction control terminals of said second and fifth switching elements and at the other end to the second potential, wherein when said eighth switching element conducts, said second and fifth switching elements are caused to not conduct so as to cut off said first and second signal transmission lines from the second potential;

a first control terminal connected to the conduction control terminals of said first and fourth switching elements, wherein when given a precharge signal, said first and



fourth switching elements are caused to conduct charging said first and second signal transmission lines to the first potential; and

a second control terminal connected to said conduction terminals of said seventh and eighth switching elements and being given said precharge signal so as to control said eighth switching element for causing said second and fifth switching elements to not conduct and which is also given a transmission signal causing said seventh switching element to conduct such that the first potential is applied to said respective one end of said third and sixth switching elements; and

a signal input to one end of said first (or said second) signal transmission line is provided to said conduction control terminal at said sixth (or the third) switching element during a second period so as to make said sixth (or said third) switching element conduct or not conduct causing said fifth (or said second) switching element to conduct or not conduct and charging said second (or said first) signal transmission line at the second potential (or the first potential) so as to transmit the signal to said second (or said first) signal transmission line.

4,962,344

SEGMENTED WAVEFORM GENERATOR

Mark W. Bohrer, Saratoga, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

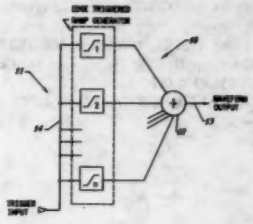
Filed May 23, 1989, Ser. No. 356,794

Int. Cl.[5] H03K *3/86*

U.S. Cl. 307—260 **12 Claims**

1. An apparatus for generating segmented waveforms comprising:

a plurality of ramp generators, each of said ramp generators having an input, an output and a means responsive to the leading edge of a trigger signal applied to said input for causing said output to change from a first magnitude to a second magnitude within a predetermined period of time in a linear fashion and to the trailing edge of said trigger signal for causing said output to change from said second magnitude to said first magnitude within said predetermined period of time in said linear fashion;



means for summing the outputs of said plurality of ramp generators; and

means for coupling said output of said ramp generators to said summing means.

4,962,345

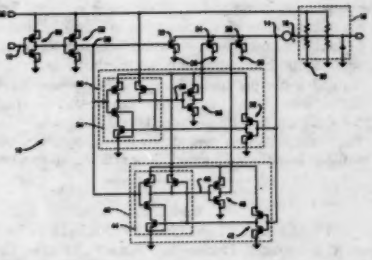
CURRENT LIMITING OUTPUT DRIVER

Harold S. Crafts, and Maurice M. Moll, both of Fort Collins, Colo., assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 6, 1989, Ser. No. 432,260

Int. Cl.[5] H03K *17/16, 5/12*

U.S. Cl. 307—270 **25 Claims**



1. An output driver comprising:

a first transistor connected between an output node and a reference voltage terminal and responsive to an input data signal;

a second transistor connected between said output node and said reference voltage terminal and responsive to a first feedback signal from said output; and

a third transistor connected between said output node and said reference voltage terminal and responsive to a second feedback signal from said output.

4,962,346

TRANSITORY CURRENT RECIRCULATION THROUGH A POWER SWITCHING TRANSISTOR DRIVING AN INDUCTIVE LOAD

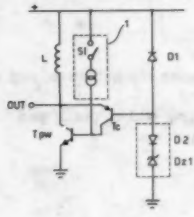
Giampietro Maggioni, Cornaredo; Fabio Marchió, Gallarate; Marco Morelli, Livorno, and Francesco Tricoli, Milan, all of Italy, assignors to SGS-Thomson Microelectronics, S.p.A., Italy

Filed Apr. 12, 1988, Ser. No. 180,501

Claims priority, application Italy, Apr. 14, 1987, 83618 A/87; Jun. 30, 1987, 83639 A/87

Int. Cl.[5] H03K *3/26, 17/60*; G05F *1/40*

U.S. Cl. 307—270 **2 Claims**



1. A circuit for recirculating a discharge current of an inductive load through the same power switching driving transistor of a first polarity having an emitter connected to a first supply rail, a collector connected to one terminal of said inductive load, the second terminal of said inductive load being connected to a second supply rail, and a base to which a driving signal is applied, comprising:

a transistor of opposite polarity with respect to the polarity of said power switching transistor and having an emitter a collector and a base;

the emitter of said transistor of opposite polarity being connected to the collector of said power transistor;

the collector of said transistor of opposite polarity being connected to the base of said power transistor;

a first diode having a cathode connected to the second supply rail operatively at a positive voltage with respect to the first supply rail;

a second diode having an anode connected to the anode of said first diode;

a Zener diode having a cathode connected to the cathode of said second diode and having an anode connected to the first supply rail;

the base of said transistor of opposite polarity being connected to the anodes, connected in common, respectively, of said first and of said second diode, said Zener diode and second diode establishing a threshold voltage on said transistor of opposite polarity, whereby said driving transistor is rendered conductive when said driving transistor's collector voltage exceeds said threshold voltage, and the voltage across said driving transistor is limited to a voltage established by said Zener diode, and second diode.

4,962,347

FLASHLIGHT WITH BATTERY TESTER

James R. Burroughs, Encino, and Alan N. O'Kain, Corona del Mar, both of Calif., assignors to Strategic Energy, Ltd., Newport Beach, Calif.

Filed Feb. 25, 1988, Ser. No. 160,143

Int. Cl.[5] H02J *7/04*

U.S. Cl. 320—48 **39 Claims**

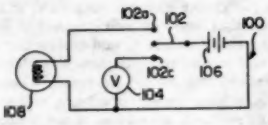
1. A portable lantern having a built-in battery tester comprising:

(a) a lantern housing for holding batteries;

(b) an electrically-powered light source mounted in said housing for energizing by the batteries in said housing;

(c) a battery-testing means mounted in said housing with indicator means of the battery-testing means detectable from outside said housing;

(d) a three-way-switch means mounted in said housing placed in a first position to connect the light source with the batteries, in a second position to connect the battery-testing means with the batteries, and in a third position to disconnect the batteries;



(e) first conductor means for electrically connecting said light source to said switch means and the batteries when said switch means is in said first position; and

(f) second conductor means for electrically connecting said battery-testing means to said switch means and the batteries when said switch means is in said second position.

4,962,348

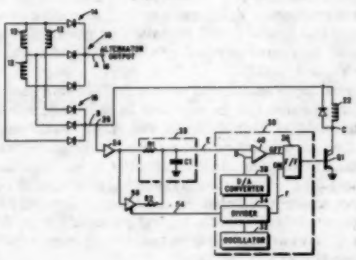
SWITCHED FILTER WITH LOW OFFSET

Arthur J. Edwards, Hoffman Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 3, 1989, Ser. No. 332,126

Int. Cl.[5] H02J *7/14*

U.S. Cl. 322—58 **12 Claims**



1. In a system that provides an output signal that is received, filtered and processed by a control circuit that controls the value of the output signal by switching a control signal, an improved control circuit for reducing the effect of switching-induced steps in the output signal, comprising:

a filter receiving the output signal, the filter having one or more filter elements that determine the time constant of the filter, and generating a filtered output signal;

processing circuitry receiving the filtered output signal for switching the control signal off and on; and

switching means coupled to the filter and responsive to the switching of the control signal for modifying the effective value of at least one of the filter elements in synchronism with the switching of the control signal so as to synchronously modify the filter's time constant.

4,962,349
BATTERY OPERATED POWER SUPPLY WITH LOW VOLTAGE START CIRCUIT

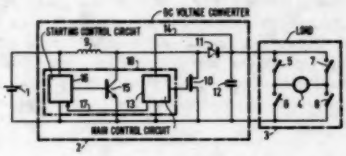
Manfred Albach, Aachen, Fed. Rep. of Germany, and Hubert C. Raets, Nieuwenhagen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 9, 1989, Ser. No. 296,268

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1988, 3802594; Sep. 3, 1988, 38300016

Int. Cl.[5] G05F *1/44*

U.S. Cl. 323—265 **10 Claims**



1. A circuit arrangement for feeding a load from a low voltage energy source via a direct-voltage conversion circuit, which periodically takes energy from the energy source by means of a main switching element and supplies it as an increased supply voltage to the load via an inductive element and a rectifier, said conversion circuit including a starting switching element by means of which energy for generating the supply voltage is taken from the energy source in a starting phase of the circuit arrangement, characterized by a main control circuit supplied with energy directly from the supply voltage and which periodically controls the main switching element, and a starting control circuit directly and exclusively supplied from the energy source and by which the starting switching element is periodically controlled, the switching periods for the starting switching element being shorter than those for the main switching element, the starting control circuit and thus the starting switching element being switched off when the supply voltage reaches a predetermined value.

4,962,350
LOAD CONDITION DETECTING AND DRIVING SYSTEM

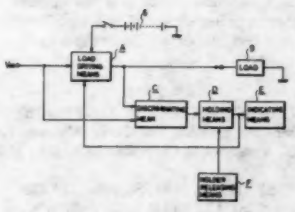
Kazuaki Fukuda, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1989, Ser. No. 398,817

Claims priority, application Japan, Aug. 30, 1988, 63-112732[U]

Int. Cl.[5] H02M *3/335*

U.S. Cl. 323—283 **6 Claims**



1. A load condition detecting and driving system comprising:

a switching means having a control terminal, a second terminal of said switching means being coupled to an input terminal of a load, said control terminal of said switching means being coupled to receive a driving signal for controlling said switching means to apply a driving current to said load; and

coupling means coupled between said input terminal of said load and said control terminal of said switching means for rendering said switching means non-conductive when said load exhibits a short circuit condition, wherein as a voltage at said input terminal of said load becomes low due to said load exhibiting said short circuit condition, a voltage at said control terminal is instantaneously pulled down sufficiently to cause said switching means to be immediately rendered non

conductive.

4,962,352
ABNORMAL WATCHING DEVICE AND METHOD FOR MICROCOMPUTER

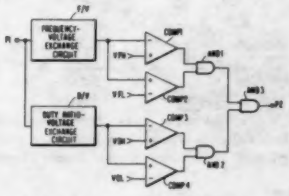
Kenichi Ogawa, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Sep. 22, 1988, Ser. No. 247,554

Claims priority, application Japan, Sep. 22, 1987, 62-237719

Int. Cl.[5] G06F *11/30*

U.S. Cl. 324—73.1 **8 Claims**



8. An abnormal watching device for a microcomputer comprising:

means for determining whether a flow watching routine is executed, and for setting a pumping flag when the flow watching routine is executed;

signal sending means for sending a normal signal when said pumping flag is set by said determining means;

internal register comparing means which reads an internal register of said microcomputer, compares the value of said internal register with an initial value of said internal register, and suspends the sending of the normal signal by said signal sending means when the value of the internal register is not equal to its initial value even if the pumping flag is set; and

a runaway resetting circuit for receiving the normal signal from said signal sending means when said pumping flag is set and said signal sending means is not suspended by said internal register comparing means, said runaway resetting circuit being operable for determining whether the normal signal is within a predetermined range of frequencies and being operable for resetting said microcomputer when the normal signal is not within the predetermined range of frequencies;

wherein said runaway resetting circuit includes a frequency-voltage circuit for receiving the normal signal and for outputting a voltage according to the frequency of the normal signal, first comparing means for comparing the output voltage of said frequency-voltage circuit with a predetermined range of voltages representing the predetermined range of frequencies, a duty ratio-voltage exchange circuit for receiving the normal signal and for outputting a voltage depending on the duty ratio of the normal signal, second comparing means for comparing the output of said duty ratio-voltage exchange circuit with a predetermined range of voltages representing a predetermined range of duty ratios, and gate means connected to said first and second comparing means, said gate means

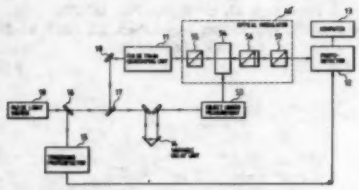
being operable for resetting said microcomputer when the output voltage of said frequency-voltage exchange circuit is outside of the predetermined range of voltages representing the predetermined range of frequencies or when the output voltage of said duty-ratio voltage exchange circuit is outside of the range of predetermined voltages representing the predetermined range of duty ratios.

4,962,353

VOLTAGE DETECTOR

Hironori Takahashi; Shinichiro Aoshima; Iakuya Nakamura, and Yutaka Tsuchiya, all of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed Oct. 12, 1988, Ser. No. 256,793
Claims priority, application Japan, Oct. 13, 1987, 62-257508
Int. Cl.[5] G01R *19/00, 31/02*
U.S. Cl. 324—96 10 Claims



1. A voltage detector using an electro-optical material with a refractive index that is changed by a voltage provided by a predetermined part of an object under measurement comprising:

an optical modulating means;

a pulse light source for outputting light pulses;

pulse train generating means for generating a light pulse train of n light pulses having a pulse interval from each light pulse provided by said pulse light source and for applying said light pulse train to said optical modulating means within a time duration, where n is an integer greater than one; and

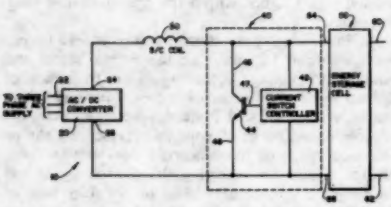
detector means for detecting the optical intensities of said n light pulses forming said light pulse train after modulation by said optical modulating means with a voltage waveform to be detected that corresponds in duration to said time duration.

4,962,354

SUPERCONDUCTIVE VOLTAGE STABILIZER

Age T. Visser, Geneva; Robert C. Trendler, St. Charles, both of Ill., and Paul F. Koeppe, Cross Plains, Wis., assignors to Superconductivity, Inc., Middleton, Wis.

Filed Jul. 25, 1989, Ser. No. 385,014
Int. Cl.[5] H01F *36/00*
U.S. Cl. 323—360 12 Claims



1. A superconductive voltage stabilizer comprising:

an energy storage cell for supplying energy to a load, said energy storage cell having a first input line, a second input line, a first output line, and a second output line, said output lines coupled to said load and cooperating to provide an output current path to said load;

a voltage regulator in parallel with said first input line and said second input line;

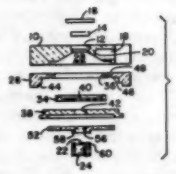
an AC/DC converter with an AC input connected to an AC supply line and producing a direct current output having a first DC terminal and a second DC terminal with said first DC terminal coupled to said first input line through a superconducting energy storage coil storing said direct current output and said second DC terminal coupled to said second input line whereby said energy supplied to said load to stabilize the operation of said load is restored to said energy storage cell by said voltage regulator which senses the voltage across said energy storage cell and delivers a portion of said direct current output stored in said superconducting energy storage coil to said energy storage cell in accordance with the energy requirements of said load.

4,962,355

THERMAL TEST CHAMBER DEVICE

Daron C. Holderfield, Boaz; Bernard E. Martin, Huntsville, both of Ala., and Samuel S. Russell, Irmo, S.C., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 27, 1988, Ser. No. 263,306
Int. Cl.[5] G01R *35/00, 31/26*
U.S. Cl. 324—158 F 6 Claims



1. A thermal test chamber device comprising upper and lower halfs defining a housing with a chamber therein, said upper housing half having an inlet port therein for injecting conditioning medium into said chamber, and outlet means for exhausting said medium, said lower housing half having a central opening therethrough with seal means mounted relative thereto with an opening through the seal means, and circuit means mounted to said lower housing half at a lower surface thereof and with said seal means sealing said lower housing half relative to said circuit means, said circuit means having opening means therethrough and aligned with said opening through said seal means and test probes projecting into said aligned opening means of said circuit means for engagement of said test probes with a test specimen.

4,962,356

INTEGRATED CIRCUIT TEST SOCKET

Delvin D. Eberlein, Altoona, and Peter Wehner, Eau Claire, both of Wis., assignors to Cray Research, Inc., Minneapolis, Minn.

Filed Aug. 19, 1988, Ser. No. 234,818
Int. Cl.[5] B01R *1/02, 1/04*
U.S. Cl. 324—158 F 2 Claims

1. Apparatus for testing integrated circuits comprising:

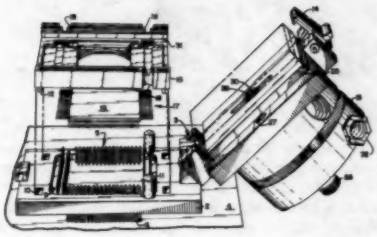
(a) a base for supporting an integrated circuit to be tested, said base having a plurality of contact pins mounted therein and positioned for contacting the leads extending from an integrated circuit positioned on said base;

(b) a lid and means operatively connected thereto for posi-

tioning said lid over said base and an integrated circuit supported thereon;

(c) lid attachment means for providing built-in play between said lid, said base, and said integrated circuit, thereby minimizing any pinching force on said integrated circuit and providing for the quick insertion and removal of said integrated circuit;

(d) fluid-pressure power operated pressure means carried by said lid and operative when energized for applying uniform pressure in a normal direction to an integrated circuit to be tested, thereby minimizing gouging and skidding



between the contact pins and leads and ensuring that the leads make reliable low ohmic and uniform electrical contact with the contact pins;

(e) control means for regulating said uniform pressure applied by said power operated pressure means, thereby ensuring a constant pressure on said integrated circuit independent of any built-in play between said lid, said base, and said integrated circuit;

(f) said fluid-pressure power operated pressure means comprising an ionizer for removing a static charge from said fluid-pressure.

4,962,357

TWO-DIMENSIONAL METHOD FOR SPECTRAL EDITING OF NMR SIGNALS PRODUCED BY METABOLITES CONTAINING COUPLED SPINS

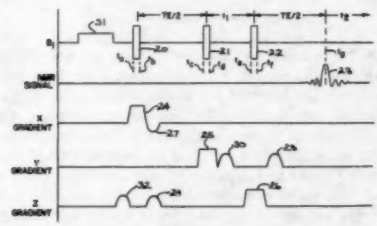
Christopher H. Sotak, 65 Kendall Rd., Jefferson, Mass. 01522

Filed Jul. 7, 1988, Ser. No. 215,979

The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—309 **4 Claims**



1. A method for producing a two-dimensional spectrum which indicates the in vivo proton spectra of metabolites, the steps comprising:

(a) applying a polarizing magnetic field to the region of interest;

(b) applying a first RF excitation field pulse in the presence of a magnetic field gradient to produce transverse magnetization in the region of interest;

(c) applying a second RF excitation field pulse in the presence of a magnetic field gradient to produce longitudinal magnetization in the region of interest at a time period (TE/2) after the first pulse, which time period (TE/2) has a value which is a function of the spin-spin coupling constant (j) of metabolite molecules of interest;

(d) applying a third RF excitation field pulse in the presence of a magnetic field gradient to restore transverse magnetization in the region of interest at a time period (t_1) after the second pulse;

(e) acquiring and digitizing the echo NMR signal which is produced beginning at a time (TE/2) after the third pulse and throughout a fourth time period (t_2);

(f) repeating steps (a) through (e) a plurality of times each with a different value for the second time period (t_1) and storing the acquired digitized echo NMR signals as a two-dimensional array of data;

(g) performing a two-dimensional Fourier transformation on the two-dimensional array of data; and

(h) produce a two-dimensional spectrum using the transformed array of data.

4,962,358

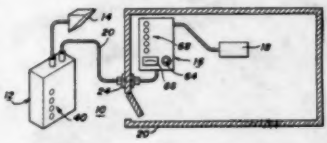
INTEGRITY MONITORING METHOD AND SYSTEM FOR SHIELDED ENCLOSURES HAVING A FIBER OPTIC CABLE FOR BIDIRECTIONAL COMMUNICATIONS BETWEEN A RECEIVER AND TRANSMITTER THEREOF

Dale G. Svetanoff, Arlington Heights, Ill., assignor to The Curran Company, Glendale Heights, Ill.

Filed Apr. 27, 1989, Ser. No. 344,284

Int. Cl.[5] G01R *27/00*; H04B *17/00*

U.S. Cl. 324—627 **22 Claims**



1. A shielding integrity monitoring system for monitoring the shield integrity of a shielded enclosure comprising:

transmitter means for transmitting predetermined signals;

receiver means separated from said transmitter means by the shielded enclosure for receiving said transmitted predetermined signals and for identifying the shielding effectiveness of the shielded enclosure; and

fiber optic cable means connected to said transmitter means and said receiver means for communicating bidirectional signals between said transmitter means and said receiver means.

4,962,359

DUAL DIRECTIONAL BRIDGE AND BALUN USED AS REFLECTOMETER TEST SET

Joel P. Dunsmore, Sebastopol, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 29, 1989, Ser. No. 373,714

Int. Cl.[5] G01R *27/28*; G01N *22/00*

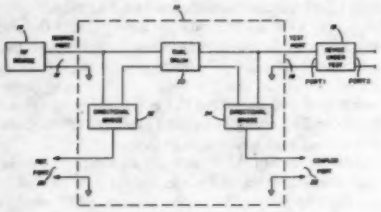
U.S. Cl. 324—638 **22 Claims**

1. A test set for separating an incident signal supplied through a test port to a device under test and a signal from the device under test, comprising:

a first directional bridge for separating the signal from the device under test and the incident signal and providing the signal from the device under test to a coupled port;

a second directional bridge for separating the incident signal and the signal from the device under test and providing the incident signal to a reference port; and

dual-balun means for receiving unbalanced inputs through an RF source port and the test port and providing separate



balanced inputs to said first directional bridge and said second directional bridge.

4,962,360

SENSOR FOR ELECTROCHEMICAL MEASUREMENT AND METHOD FOR DIAGNOSING CORROSION PROTECTIVE PROPERTIES OF METAL SURFACE COATING BY USING THE SENSOR

Koji Hosma; Hiroshi Kihira; Satoshi Ito; Kazumi Matsuoka, and Noriyuki Hirosawa, all of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 22, 1989, Ser. No. 354,663

Claims priority, application Japan, May 24, 1988, 63-126242

Int. Cl.[5] G01N *27/02, 17/00*

U.S. Cl. 324—700 **11 Claims**

1. A sensor for electrochemical measurement comprising:

a chamber made of an electrically insulative material and having an open end portion adapted to be in contact with a surface to be measured;

a super absorbent polymer material filled in said chamber and absorbing at a selected rate a liquid electrolyte;

an electrode disposed in said chamber; and

open end covering means which covers the open end portion of said chamber and which prevents said super absorbent polymer material from dropping out from said chamber but permits said liquid electrolyte to transmit through said open end covering means.

4,962,361

IGNITION COIL FOR ENGINE

Yasuhiko Ida, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1989, Ser. No. 399,811

Int. Cl.[5] H01F *27/04, 15/10, 27/26*

U.S. Cl. 336—90 **2 Claims**

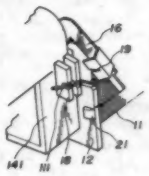
1. An ignition coil for an engine, comprising:

a coil bobbin;

a terminal coupler integrally formed on said coil bobbin;

a connecting terminal rotatably attached so that it can be electrically connected to a terminal arranged in said terminal coupler, said connecting terminal having a cut groove having a groove width at its inner side slightly smaller than a diameter of wire forming a coil on said bobbin and

a holder provided at the side of said terminal coupler to hold a terminal end of said coil pulled out of said coil bobbin;



said connecting terminal being arranged to be rotated to cause the terminal end of the coil held in the groove of said holder to become bited by said cut groove, thereby forming an electric connection between said connecting terminal and the terminal end of said coil.

4,962,362

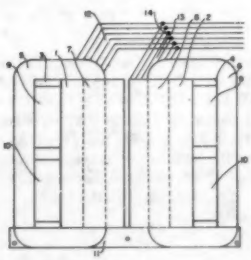
MULTI-MAGNETIC FIELD PLURAL CORE TRANSFORMER

Richard W. Whittaker, 5 North Way, Hopatcong, N.J. 07843

Filed Mar. 30, 1989, Ser. No. 330,438

Int. Cl.[5] H01F *27/30*

U.S. Cl. 336—175 **15 Claims**



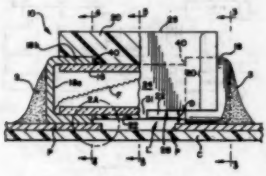
1. A multi-magnetic field low voltage system transformer having first and second non-contacting single-loop generally rectangular core loops of ferromagnetic material, each of said core loops including first and second leg members that are generally parallel to one another and to the leg members of the other of said core loops, said first leg member of said first core loop being positioned adjacent to said first leg member of said second core loop, said second leg member of said first core loop being positioned remote from said second leg member of said second core loop, a first primary winding encircling only said first leg member of said first core loop, with the remainder of said first core loop being substantially free of primary windings, a second primary winding encircling only said first leg member of said second core loop, with the remainder of said second core loop being substantially free of primary windings, means for electrically interconnecting said primary windings in parallel circuit with one another, and a first secondary winding passing through said first and second core loops and forming a bight within which said first and second primary windings on said first leg members of said core loops are located.

4,962,363

SURFACE MOUNTABLE LEADLESS FUSE

William F. Sexton, Jr., Porter, Ind., assignor to Littelfuse, Inc., Des Plaines, Ill.

Filed Apr. 10, 1989, Ser. No. 335,682
Int. Cl.[5] H01H *85/02*
U.S. Cl. 337—186 10 Claims



1. A surface mountable leadless fuse comprising:

a fuse sub-assembly including a nonconductive tubular housing with opposite initially open ends, a pair of conductive end caps closing said tubular housing ends and a fusible element within said housing electrically connected between said end caps;

each end cap including an end wall and an end cap skirt extending from said end wall, said end cap skirt being dimensioned to receive an end portion of said tubular housing therein;

a body of insulating material molded around said fuse sub-assembly in sealing relation therewith, said body, when said fuse sub-assembly is horizontally oriented for mounting on a horizontal support surface of a circuit board, including a top surface, a bottom surface, opposed end surfaces and opposed sides; and

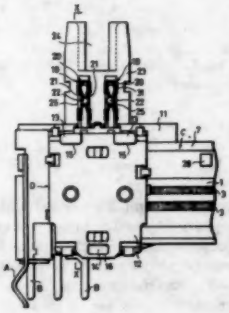
at least a portion of each said end cap skirt protruding form said bottom surface of said body of insulating material, so that said at least a portion of each end cap skirt can engage a flat conductive surface on said horizontal support surface of said circuit board for soldering thereto without obstruction from said body.

4,962,364

ILLUMINATING TYPE LINEAR RESISTOR FOR VOLUME CONTROL

Tsutae Okuya, and Tsuguhisa Hayashida, both of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 4, 1988, Ser. No. 228,669
Claims priority, application Japan, Nov. 18, 1987, 62-174973[U]
Int. Cl.[5] H01C *10/30*
U.S. Cl. 338—119 5 Claims



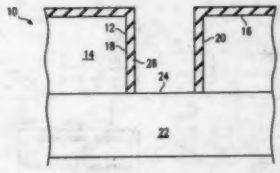
1. An illuminating type linear resistor comprising an insulating substrate; a pattern of resistor and collector formed on one surface of said insulating substrate; a lead formed on the other surface of said insulating substrate for supplying power to an LED; a slider mount assembly surrounding said insulating substrate and separatably formed into first and second slider mounts; a knob provided on said first slider mount, said knob being formed at its upper end with a receiving portion for receiving said LED; a first slider mounted on said first slider mount and adapted to slidingly contact said pattern of resistor and collector; a second slider mounted on said second slider mount and adapted to slidingly contact said lead; and a clip provided at an extension of said second slider for holding a terminal of said LED, said clip being received in said knob of said first slider mount.

4,962,365

INTEGRATED CIRCUIT TRENCH RESISTOR

Robert H. Havemann, Garland, and Robert H. Eklund, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 30, 1989, Ser. No. 330,652
Int. Cl.[5] H01C *1/012*
U.S. Cl. 338—306 11 Claims



1. A resistor formed in an integrated circuit comprising:

a substrate having a first conductivity type;

a trench formed in said substrate extending from a surface of said substrate into said substrate;

an insulating layer formed on the sidewalls of said trench;

a buried doped region formed in said substrate at the bottom of said trench, said buried doped region being spaced from said surface and said buried dope region having a second conductivity type opposite to said first conductivity type;

a resistive filling filling the remainder of said trench and providing a resistive electrical connection between said buried doped region and the surface of said substrate.

4,962,366

AUTOMATIC TURN SIGNAL CANCELLING APPARATUS

Kaoru Hatanaka, Saitama; Yukio Miyamaru, Tokyo, and Shigeo Kawada, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 5, 1983, Ser. No. 455,731
Claims priority, application Japan, Jan. 8, 1982, 57-1427; Aug. 5, 1982, 57-136732
The portion of the term of this patent subsequent to Jan. 9, 2006, has been disclaimed.
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 340—56 8 Claims

1. An automatic turn signal cancelling apparatus for a motorized cycle, comprising:

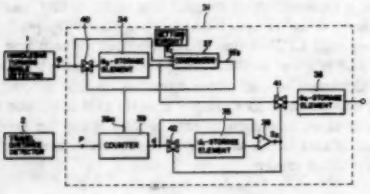
a turning angle detector for detecting an handlebar turning angle when the motorized cycle makes a turn;

a distance detector for detecting a travel distance and producing a pulse output;

means, operatively connected with said turning angle detector and said distance detector, for accumulating the output of said turning angle detector in synchronism with the output pulse from said distance detector; and

logical arithmetic means, operatively connected with said

turning angle detector and said accumulation means, for deciding upon cancellation of a turn signal on the basis of



a combination of an output signal from said turning angle detector and that from said accumulation means.

4,962,367

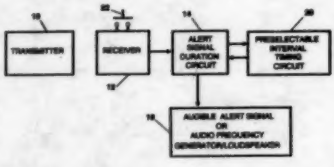
REMOTELY ACTIVATED TIMER ALERT SYSTEM

Gary P. Tyma, 1119 Song Ct., San Jose, Calif. 95131

Filed Dec. 29, 1988, Ser. No. 291,494

Int. Cl.[5] G08B *1/00*

U.S. Cl. 340—309.4 **12 Claims**



1. A remotely activated timer alert system for signaling, when remotely activated, the beginning and end of a preselected time interval, comprising in combination;

transmitter means selectively operable to transmit an EMR (electromagnetic-radiation) signal;

receiver means for receiving and responding to said EMR signal, said receiver means having a receiver output with a high output impedance when said EMR signal is not received and a low output impedance when said EMR signal is received;

alert signaling means, coupled to said receiver output, having an alert operational cycle and a standby mode of operation in which it responds to said output impedance by initiating and completing said alert operational cycle, said alert operational cycle comprising: (1) producing a first audible alert signal upon transition of said receiver output from said high to said low impedance, and (2) producing a second audible alert signal at a preselected time interval after said first audible alert signal;

said alert signaling means responding to said output impedance only when in said standby mode of operation, and ignoring output-impedance transitions occuring during said operational cycle.

4,962,368

RELIABILITY AND WORKABILITY TEST APPARATUS FOR AN ENVIRONMENTAL MONITORING SYSTEM

John J. Dobrzanski, New Britain, Conn.; Jeffrey J. McCabe, Owen Sound, Canada, and Robert W. Right, Huntington, Conn., assignors to General Signal Corporation, Stamford, Conn.

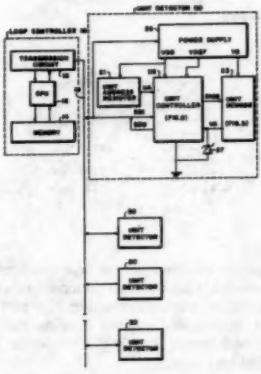
Filed May 4, 1989, Ser. No. 347,543

Int. Cl.[5] G08B *29/00*

U.S. Cl. 340—514 **6 Claims**

5. In an environmental monitoring system having a transmission line, a plurality of unit detectors coupled to the line and a controller coupled to the line and arranged to sequentially address the units one by one with a message for a data collection operation or a test operation and to receive data from the unit so addressed, the improvement comprising:

the controller comprising means, including a program, for directing the polling such that a test instruction is sent



sequentially to the units respectively on successive loop polls, where a loop poll is one poll of all the units coupled to the line, whereby the testing of the units progresses among the units, one by one, in successive loop polls.

4,962,369

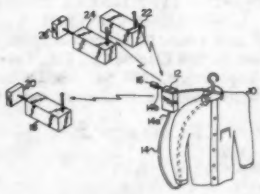
MERCHANDISE SECURITY SYSTEM UTILIZING RF TRANSMITTER

Leo R. Close, Sepulveda, Calif., assignor to Marcia Israel, Los Angeles, Calif.

Filed Feb. 9, 1989, Ser. No. 308,771

Int. Cl.[5] G08B *13/24*

U.S. Cl. 340—572 **19 Claims**



1. A security tag for attachment to an article of merchandise or the like, comprising:

a housing;

a battery enclosed within the housing;

a series combination of a capacitor and a resistor connected across the battery whereby the capacitor is charged by said battery through said resistor;

a radio frequency transmitter enclosed within the housing;

a pair of terminals disposed in series with said transmitter, the series combination of said terminals and transmitter being connected across said capacitor; and

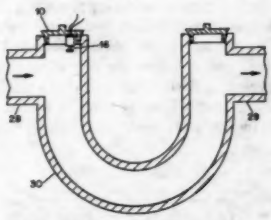
means disposed across the terminals for electrically connecting the terminals in response to an alarm condition, connection of said terminals coupling the capacitor across said transmitter, the energy stored in said capacitor momentarily energizing the transmitter to radiate a radio frequency signal burst.

4,962,370

OFF-CENTER CAP-LEVEL MAGNETIC FLOAT SEWER ALARM

John Borriello, 64 Hillview Ave., Port Washington, N.Y. 11050

Filed Apr. 25, 1989, Ser. No. 343,077
Int. Cl.[5] G08B 21/00
U.S. Cl. 340—623 4 Claims



1. An alarm unit for detecting blockage of a waste line for installation in a service opening of a trap, immediately adjacent a horizontal waste line connected to said trap, comprising a circular conventional cap member including a threaded periphery for connection to said service opening and having a horizontal top portion closing said service opening and a switch member mounted in an off-center bore in said top portion of said cap member, said switch member including a central rod containing a magnetically activated switch extending from the inner surface of said top portion and a float member circumferentially surrounding said central rod and slideably moveable on said central rod between a first position near said top portion and a second position away from said top portion and defined by a lower stop on said central rod, said float member including a permanent magnet for activating said magnetically activated switch to close said switch when said float member is in said first position and to open said switch when said float member is in said second position, said switch member being mounted to said bore by a portion of said central rod remote from said lower stop and including electrical leads extending from said central rod to the exterior side of said top portion, said threaded periphery being fabricated such that said cap member can be tightened in said service opening while said switch member in the off-center bore is oriented horizontally away from the inlet of the trap connected to the horizontal waste line, whereby when said alarm unit is mounted directly to the service opening of the trap adjacent the waste line with said switch member oriented away from said waste line, said switch member is activated in response to a blockage condition, but is not activated by normal flow in said waste line.

4,962,371

CPS ALARM SYSTEM

Bradley A. Repp, Woodbridge; Albert M. Wurm, Colonial Beach; Adam J. Simonoff, Dahlgren, and Spencer R. Courtney, Fredricksburg, all of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

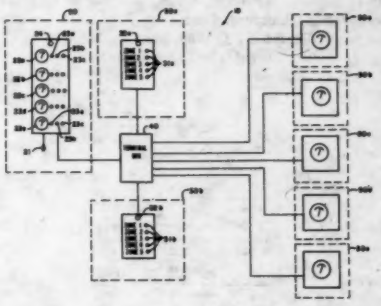
Filed Nov. 14, 1988, Ser. No. 270,555
Int. Cl.[5] G08B 21/00
U.S. Cl. 340—626 20 Claims

1. A collective protection system alarm comprising:

one or more zone monitoring stations containing at least one pressure transducer remote from but in electrical connection with;

a master display panel having a plurality of ammeters in signal correspondence with said one or more zone monitoring stations; and

one or more slave display panels physically remote from both said one or more zone monitoring stations and said master display panel whereby status of ambient pressure surrounding said one or more zone monitoring stations



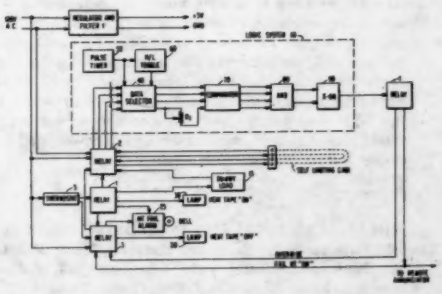
may be monitored at one or more sites remote from said master display panel and said zone monitoring stations.

4,962,372

SELF LIMITING CABLE SUPERVISORY DEVICE

Eugene L. Swier, 48 Munsill Ave., Bristol, Vt. 05443

Filed May 30, 1989, Ser. No. 357,922
Int. Cl.[5] G08B 21/00
U.S. Cl. 340—640 12 Claims



1. A dual mode apparatus for supervising self limiting cable comprising:

logic means for comparing a known resistance value of said self limiting cable over its entire length with high and low resistance values measured alternately from each end of said cable when said self limiting cable is in an "OFF" mode and thus disconnected from a high voltage source;

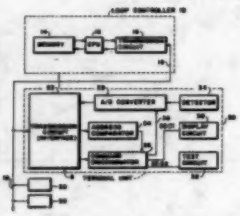
a dummy load;

means for connecting one of said dummy load and said self limiting cable to said logic means, wherein during an ON mode of said cable, said logic means is connected to said dummy load, and said cable is connected to said high voltage source, and during said OFF mode of said cable, said cable is disconnected from said high voltage source, and is connected to said logic means wherein said logic means is operable for providing a signal indicating that no shorts and opens exist in said cable.

4,962,373
SCHEME FOR POWER CONSERVATION IN FIRE ALARM SYSTEM

Brian D. Sirois, Harwinton, Conn., assignor to General Signal Corporation, Stamford, Conn.

Filed May 1, 1989, Ser. No. 345,597
Int. Cl.[5] G08B 23/00
U.S. Cl. 340—693 10 Claims



1. Apparatus for conserving the power supplied to a plurality of light emitting devices associated with respective terminal units in a fire alarm system or the like comprising:

a transmission line;

a plurality of terminal units connected to said transmission line;

each of said terminal units having comparison means for determining whether a received address signal coincides with an identification address stored in the terminal unit, said comparison means producing an output signal responsive to coincidence;

a loop controller connected to the transmission line for transmitting a plurality of address signals cyclically to said terminal units, said loop controller further including means for generating command signals for causing illumination of the light emitting devices of said terminal units; and

means for selecting a blinking mode of operation for said command signals such that respective groups of said light emitting devices are thereby intermittently illuminated at different discrete intervals, said means for selecting being operative such that the ON time periods for all of said light emitting devices, except the first, are the same, but the OFF time periods are varied in dependence on the total number of light emitting devices to be supplied with power.

4,962,374
THIN FILM EL DISPLAY PANEL DRIVE CIRCUIT

Yoshide Fujioka, Nara; Yoshiharu Kanatani, Nara; Toshihiro Ohba, Nara, and Hisashi Uede, Wakayama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 942,398, Dec. 16, 1936, abandoned.
This application Jun. 26, 1989, Ser. No. 372,136
Claims priority, application Japan, Dec. 17, 1985, 60-286242
Int. Cl.[5] G09G 3/12
U.S. Cl. 340—781 6 Claims

1. A drive circuit for a thin film electroluminescent (EL) display panel having a plurality of scanning electrodes extending in one direction, a plurality of data electrodes extending in a second direction orthogonal to said first direction, and an EL layer sandwiched therebetween, picture elements being formed at intersections of said scanning and data electrodes, the circuit comprising:

first switching circuit means connected to each of said scanning electrodes for applying a scanning voltage of negative polarity thereto;

second switching circuit means connected to each of said scanning electrodes for applying a scanning voltage of positive polarity thereto;

data electrode driver means for driving said data electrodes, including

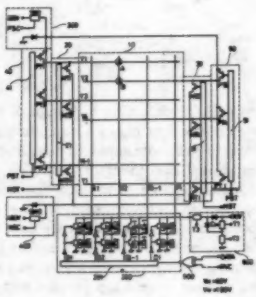
third switching means for applying a charging modulated voltage to each of said data electrodes, and

fourth switching means for discharging each of said data electrodes;

fifth switching circuit means for providing said voltage of negative polarity to said first switching circuit means;

sixth switching circuit means for providing said voltage of positive polarity to said second switching circuit means;

seventh switching circuit means connected to said third switching circuit means for providing modulated voltage levels of a first value, a second value less than said first value, and a floating level to said third switching circuit means; and



means for driving said EL display panel in two fields by providing signals to said first through seventh switching circuit means wherein odd numbered scanning electrodes are provided with said negative polarity voltage and even numbered scanning electrodes are provided with said positive polarity voltage in a first field, said negative and positive polarities being reversed in a second field, selected data electrodes intersecting said odd numbered scanning electrodes being sequentially provided with said second and first values of said modulated voltage levels during said first field and being discharged during said second field, and selected data electrodes intersecting said even numbered scanning electrodes being discharged during said first field and being sequentially provided with said second and first values during said second field.

4,962,375
DRIVING CIRCUIT FOR A LIGHT EMITTING DIODE ARRAY

Hideo Hirane, Hitachi; Kiyohiko Tanno, Katsuta; Kentaro Yagi, Ichikawa, and Hisao Iitsuka, Hitachi, all of Japan, assignors to Hitachi, Ltd.; Seiko Instruments Inc. and Hitachi Cable, Ltd., Tokyo, Japan

Filed Mar. 24, 1988, Ser. No. 172,634
Claims priority, application Japan, Mar. 27, 1987, 62-71468
Int. Cl.[5] G09G 3/32
U.S. Cl. 340—782 11 Claims

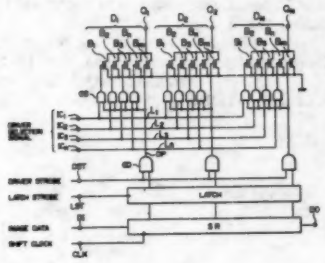
1. A driving circuit for driving a light emitting diode array including at least a row of light emitting diode elements so that they emit light selectively depending on image data to be printed, comprising:

a first register successively storing sequential image data;

a second register temporarily holding said image data successively stored in said first register;

m drivers associated with each of said light emitting diode elements, said drivers being driven on the basis of said image data held in said second register; and

means for selectively adjusting output current to a light emitting diode connected to m drivers by controlling n of



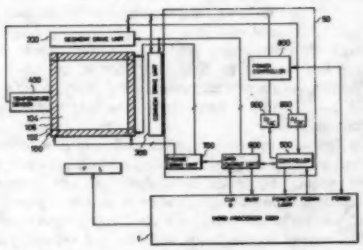
said m drivers in accordance with a driver selection signal, wherein m and n are integers greater than one.

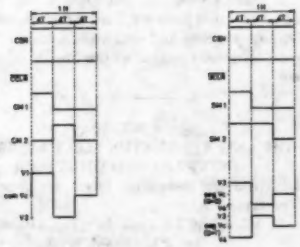
4,962,376

DISPLAY CONTROL APPARATUS HAVING A PLURALITY OF DRIVING VOLTAGE SUPPLYING MEANS

Hiroshi Inoue, Yokohama, and Hideo Kanno, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1988, Ser. No. 175,398
Claims priority, application Japan, Mar. 31, 1987, 62-76360
Int. Cl.[5] G09G *3/36*
U.S. Cl. 340—784 **3 Claims**





1. A display control apparatus comprising:

display means including a scan electrode disposed in a first direction and a signal electrode disposed in a second direction substantially orthogonal to the first direction, with said signal electrode being separated from said scan electrode by a predetermined distance, and a gap between said scan electrode and signal electrode being filled with liquid crystal;

driving voltage supplying means for supplying a driving voltage;

scan side driving voltage supplying means for generating plus and negative driving voltages on the basis of the driving voltage supplied by said driving voltage supplying means, wherein a ratio of a potential difference between the plus driving voltage and a predetermined reference voltage and a potential difference between the negative driving voltage and a predetermined reference voltage is the same, and for supplying the generated plus and negative driving voltages to said scan electrode;

signal side driving voltage supplying means for generating plus and negative driving voltages on the basis of the driving voltage supplied by said driving voltage supplying means, wherein a ratio of a potential difference between the plus driving voltage and a predetermined reference voltage and a potential difference between the negative driving voltage and the reference voltage is the same, and for supplying the generated plus and negative driving voltages to said signal electrode; and

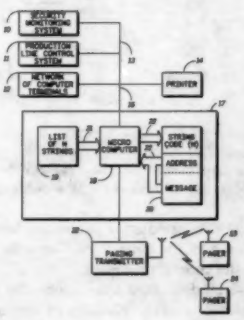
control means for controlling said display means so as to change the driving voltage supplied by said scan side driving voltage supplying means and the driving voltage supplied by said driving voltage supplying means.

4,962,377

PAGING BY TEXT MATCHING

Craig S. Wallace, and Robert L. Breeden, both of Boynton Beach, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 9, 1989, Ser. No. 308,281
Int. Cl.[5] H04B *1/00*
U.S. Cl. 340—825.440 **8 Claims**



1. A selective call system comprising:

means for receiving a predetermined plurality of characters;

string searching means for monitoring said received plurality of characters including;

means for storing a plurality of predetermined character strings, each character string of said plurality including at least one instructional character; and

means for comparing sequentially the plurality of predetermined character strings of said storing means with said received predetermined plurality of characters to identify a predetermined character string of said plurality which correlates with the received characters;

control means responsive tot he identified predetermined character string for selectively generating an address of a selective call receiver and message based on said identified predetermined character string and said at least one instructional character thereof; and

transmitting means responsive to the control means for transmitting said selectively generated address and mes-

sage to the selective call receiver identified by that address.

4,962,378

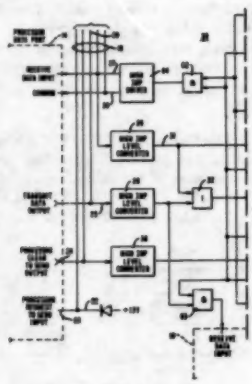
MULTI-USER SERIAL BUS SYSTEM

Richard J. Fadem, Roslyn Heights, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 9, 1987, Ser. No. 118,814

Int. Cl.[5] H04Q *1/30, 9/02*

U.S. Cl. 340—825.500 **12 Claims**



1. A digital data communication system for transferring data between a plurality of terminals to a central processor, comprising:

a first serial data conductor connected between the central processor and the plurality of terminals for outputting data to the central processor;

a second serial data conductor connected between the central processor and the plurality of terminals for receiving data from the central processor;

a clear-to-send control conductor connected from the central processor to the plurality of terminals for enabling a data transfer between the central processor and one of the plurality of terminals;

request-to-send means for outputting a request-to-send indicator to the central processor enabling the data transfer from the central processor to one of the plurality of terminals;

means for detecting a not-busy condition of the first and second serial data conductors;

means responsive to the not-busy detecting means for controlling the outputting of data to the central processor from one of the plurality of terminals via the first serial data conductor on a first-come, first-served basis; and

delay means for preventing each terminal from initiating a data transfer for a preselected delay period after the cessation of the busy condition to provide the terminal and the central processor a period to respond to the data transfer therebetween.

4,962,379

ARBITER CIRCUIT FOR PROCESSING CONCURRENT REQUESTS FOR ACCESS TO SHARED RESOURCES

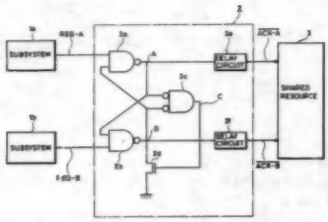
Kenichi Yasuda; Toshifumi Kobayashi, and Michihiro Yamada, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1988, Ser. No. 286,921

Claims priority, application Japan, Nov. 19, 1987, 62-292831

Int. Cl.[5] H04Q *1/20*

U.S. Cl. 340—825.510 **5 Claims**



1. An arbiter circuit comprising:

SR flip-flop means operable to provide signals to its two outputs in response to first and second request signals externally supplied thereto, said first and second request signals shiftable between first and second logic levels;

sensing means to provide a sense output signal when said output signals from said two outputs of said flip-flop means reach simultaneously an intermediate level between said first and second logic levels;

driver means operable in response to said sense output signal form said sensing means to positively drive one of said two output signals from said flip-flop to one of said first and second logic levels; and

means for transferring said two output signals from said flip-flop means as first and second acknowledgement signals with a predetermined time delay, wherein

said SR flip-flop means comprises first and second gate means,

said first gate means is supplied with said first request signal and an output signal from said second gate means,

said second gate means is supplied with said second request signal and an output signal from said first gate mans,

said sensing means includes a third gate means supplied with the output signals from said first and second gate means and having a threshold level in the neighborhood of said intermediate level,

said driver means comprises a voltage source for providing one of said first and second logic levels, and switching means connected between one of said two outputs of said SR flip-flop means and said voltage source and having a control terminal coupled to the output of said third gate means.

4,962,380

METHOD AND APPARATUS FOR CALIBRATING AN INTERLEAVED DIGITIZER

Robert D. Meadows, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 21, 1989, Ser. No. 410,687

Int. Cl.[5] H03M *1/10*

U.S. Cl. 341—120 **16 Claims**

1. An apparatus for calibrating an interleaved digitizer comprising:

(a) a system oscillator for generating a master clock signal;

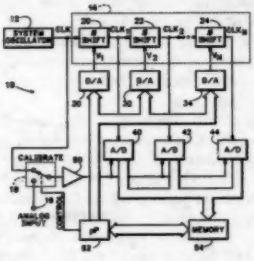
(b) a plurality of cascaded phase shifting circuits for producing a plurality of phase shifted clock signals from the master clock signal;

(c) means for digitizing the master clock signal at time inter-

vals determined by the phase shifted clock signals to produce a digitized output;

(d) means for storing the digitized output of the digitizing means;

(e) means for comparing the stored digitized output to predetermined reference levels; and



(f) means for adjusting the phase shift of each of the phase shifting circuits as a function of the difference between the stored digitized output and the predetermined reference levels.

4,962,381

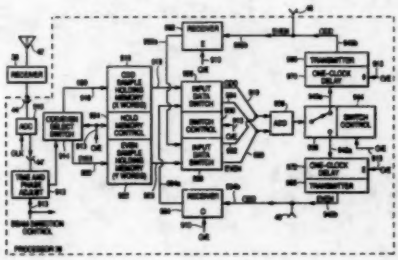
SYSTOLIC ARRAY PROCESSING APPARATUS

Walter A. Helbig, Sr., Medford Lakes, N.J., assignor to General Electric Company, Moorestown, N.J.

Filed Apr. 11, 1989, Ser. No. 336,997

Int. Cl.[5] G01S 7/03

U.S. Cl. 342—372 **9 Claims**



1. A systolic array apparatus for combining information received substantially simultaneously at a plurality of input terminals which are regularly located along a line, comprising:

a processor at each of said locations, each processor including an input port adapted to be coupled to said input terminal at said location, for receiving information from said input terminal during sequential intervals, each processor also including an information store for temporary storage of said information and also including at least first and second input/output terminals, for (a) under a first condition accepting information associated with a first one of said intervals from a first adjoining processor at said first input/output terminal for combining the information so received from said first adjoining processor with that portion of said stored information received at said input terminal during said first one of said intervals to produce a first combined signal at said second input/output terminal, and (b) under a second condition accepting information associated with a second one of said intervals from a second adjoining processor at said second input/output terminal, for combining the information so received from said second adjoining processor with that portion of said stored information received at said input terminal which is associated with said second one of said intervals to produce a second combined signal at said first input/output terminal

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4,962,382

MODIFIED MULTI-CHANNEL BRAGG CELL USING A PHASED ARRAY STRUCTURE FOR THE IMPROVEMENT OF OVERALL EFFICIENCY

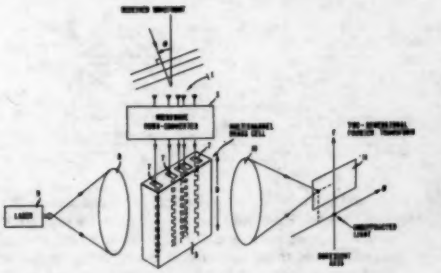
Jim P. Lee, Nepean, Canada, assignor to Her Majesty the Queen as represented by the Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed Mar. 13, 1989, Ser. No. 322,379

Claims priority, application Canada, Mar. 18, 1988, 561917

Int. Cl.[5] G02F 1/33

U.S. Cl. 342—372 **11 Claims**



1. A multi-channel Bragg cell for acoustooptically modulating a beam of light with one or more input signals received via a plurality of antennae, comprised of a block of acoustooptic material on which said beam is used to illuminate the Bragg cell for receiving and transmitting said beam therethrough; and a plurality of transducers connected to said antennae, for receiving and applying said input signals to said block such that a plurality of acoustic waves are generated therein for diffracting and thereby modulating said beam of light, said transducers being arranged in a phased array comprised of a plurality of sets of said transducers, each of said transducer sets being connected to a corresponding one of said antennae and being comprised of five transducers arranged in parallel on said block, each of said transducers being of predetermined height and uniformly spaced from one another by a distance of approximately one and one tenth said predetermined height, whereby a large portion of said received beam is modulated, thereby resulting in high signal reception efficiency of said Bragg cell.

4,962,383

LOW PROFILE ARRAY ANTENNA SYSTEM WITH INDEPENDENT MULTIBEAM CONTROL

Carl P. Tresselt, Towson, Md., assignor to Allied-Signal Inc., Morris Township, N.J.

Filed Nov. 8, 1984, Ser. No. 669,555

Int. Cl.[5] H01Q 00/00

U.S. Cl. 343—700 MS **12 Claims**

1. Apparatus for radiating microwave energy comprising:

an array of antenna elements,

a plurality of couplers each having first and second input ports and third and fourth output ports,

each said coupler having said third port coupled to one of said antenna elements and said fourth port coupled to another one of said antenna elements to form a plurality of antenna subarrays,

each antenna element of each said subarray positioned sub-

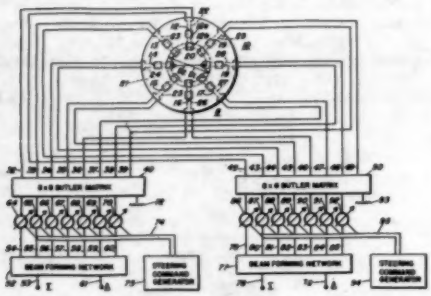
stantially a quarter wavelength apart from the other antenna element at a desired operating frequency,

a first beam forming network for generating a plurality of first input signals representative of a first predetermined pattern to be radiated, and

a second beam forming network for generating a plurality of second input signals representative of a second predetermined pattern to be radiated,

said plurality of first input signals coupled to said first input port of said plurality of couplers, respectively,

said plurality of second input signals coupled to said second input port of said plurality of couplers, respectively,



each said coupler including means for transmitting the first input signal from said first input port to said third and fourth output ports and for shifting the first transmitted signal at said third output port by 90° with respect to the first transmitted signal at said fourth output port, and means for transmitting the second input signal from said second input port to said third and fourth output ports and for shifting the second transmitted signal at said fourth by 90° with respect to the second transmitted signal at said third port.

4,962,384

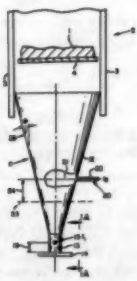
MICROWAVE ANTENNA APPARATUS

Charles W. E. Walker, 591 West 57th Avenue #301, Vancouver, B.C., Canada

Continuation of Ser. No. 129,609, Dec. 7, 1987, abandoned, which is a division of Ser. No. 836,964, Mar. 6, 1986, Pat. No. 4,727,311. This application Nov. 28, 1989, Ser. No. 443,054

Int. Cl.[5] H01Q *13/00*

U.S. Cl. 343—786 **6 Claims**



1. Microwave antenna apparatus for measuring the moisture content of material, comprising:

a first antenna portion of conical shape;

a second antenna portion of circular cylindrical shape having one end closed and joined at its open end to the small end of said first antenna portion and coaxial therewith, said second antenna portion being of substantially the same diameter as said small end of said first antenna portion;

a first microwave signal connection means connected to the side of said first antenna portion for transmitting a first microwave signal;

a second microwave signal connection means connected to the side of said second antenna portion for transmitting a second microwave signal of different frequency than said first microwave signal;

said first and second connection means being spaced apart by a longitudinal distance along the axis of the antenna and by a circumferential displacement angle about the axis of the antenna; and

said second connection means being spaced from a closed end of the second antenna portion by an old multiple of a quarter wavelength of the second microwave signal and said first connection means being spaced from a point on the first antenna portion where the diameter of its cone is equal to the microwave cut-off diameter for the frequency of the first microwave signal by a distance which is multiple by a half wavelength of the first microwave signal.

4,962,385

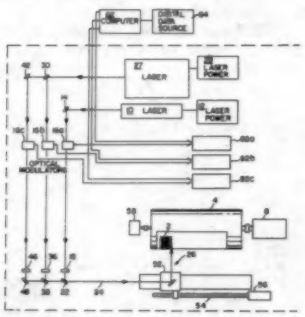
EXPOSURE CONTROLLED IMAGING SYSTEM

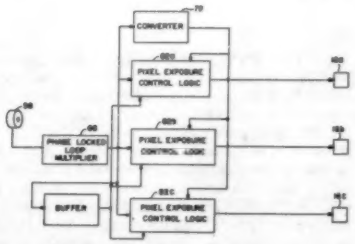
David A. Zlotek, Nashua, N.H., assignor to Cirrus Technology Inc., Nashua, N.H.

Filed Feb. 7, 1989, Ser. No. 306,847

Int. Cl.[5] G01D *9/00, 15/14;* **H04N** *1/21*

U.S. Cl. 346—1.1 **7 Claims**





7. In a digital imaging system, the method comprising the steps of

producing a focused beam,

exposing photographic film having relative motion with respect to said beam,

generating a series of electrical pulses having a repetition rate bearing a direct relationship to the relative speed of movement between said film and said beam whereby the

interval between said pulses represents a specific increment of relative movement between said film and said beam,

turning said beam successively on and off in accordance with a pre-established ratio of on-time to off-time, and

controlling the on time of said beam as function of the repetition rate of said pulses.

4,962,386

COLOR IMAGE RECORDING SYSTEM USING MULTI-LAYER, HEAT-SENSITIVE RECORDING MATERIAL

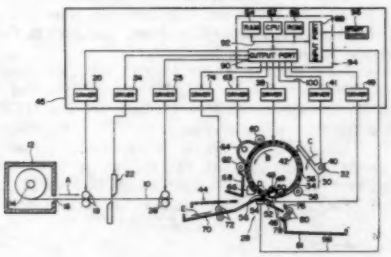
Kunio Hakkaku, and Shinichi Kaida, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 6, 1989, Ser. No. 333,947

Claims priority, application Japan, Apr. 7, 1988, 63-85724; May 27, 1988, 63-129570; May 27, 1988, 63-129571; May 27, 1988, 63-129572

Int. Cl.[5] G01D *9/00, 15/10*

U.S. Cl. 346—1.1 **20 Claims**



11. An image recording apparatus for recording an image on a heat-sensitive recording material having on both sides of a sheet-like transparent support member a plurality of transparent heat-sensitive color developing layers that develop colors different from each other, comprising:

a rotatable member around the outer circumference of which said heat-sensitive recording material is wound;

a recording head located in opposition to the outer circumference of said rotatable member for heat-processing said transparent heat-sensitive color developing layers on said heat-sensitive recording material, wound around said rotatable member, to develop respective color; and

reversing means for once taking away said heat-sensitive recording material from said rotatable member and turning said heat-sensitive recording material upside down.

20. An image recording method of recording an image by a single recording head on a heat-sensitive recording material which has a first transparent heat-sensitive color developing layer and a second transparent heat-sensitive color developing layer formed on said first transparent heat-sensitive color developing layer on one side of a transparent support member and a third transparent heat-sensitive color developing layer formed on the other side of said transparent support member, comprising the steps of:

placing said one side of said transparent support member opposite to said recording head for heat-processing said second transparent heat-sensitive color developing layer:

irradiating light of predetermined wavelength onto said heat-sensitive recording material to fix the developed color of said second transparent heat-sensitive color developing layer;

reversing said heat-sensitive recording material upside down while continuing the irradiation of said light, to place said the other side of said transparent support member opposite to said recording head for heat-processing said third transparent heat-sensitive color developing layer; and

reversing said heat-sensitive recording material upside down again after the heating process of said third transparent heat-sensitive color developing layer, to place said one side of said transparent support member opposite to said recording head for heat-processing said first transparent heat-sensitive color developing layer.

4,962,387

THERMAL TRANSFER PRINTING APPARATUS

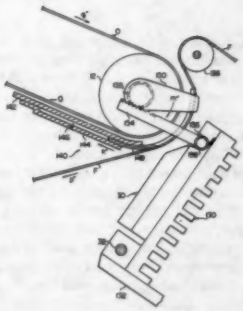
Junichi Yamamoto; Yoshio Tohyama, and Masahiro Shiigi, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 23, 1989, Ser. No. 355,669

Claims priority, application Japan, May 24, 1988, 63-127658; Jun. 1, 1988, 63-136456

Int. Cl.[5] G01D *15/10;* **B41J** *35/04*

U.S. Cl. 346—76 PH **17 Claims**



1. A thermal transfer printing apparatus comprising

(a) a platen roller rotatable in a first direction and a second direction opposite to the first direction,

(b) first feeding means for feeding a recording medium on said platen roller,

(c) second feeding means for feeding a continuous length of carrier medium in conjunction with said recording medium on said platen roller so that the carrier medium may be in contact with the recording medium, said carrier medium having a succession of colored areas carrying differently colored inks,

(d) a thermal print head movable between an inoperative position spaced apart from said platen roller and an operative position having said carrier medium pressed against the recording medium on said platen roller and operative to form an image on said recording medium by thermal transfer of an ink from one of said colored areas of said carrier medium to the recording medium,

(e) a guide member movable between a first position close to said platen roller and a second position spaced apart from the platen roller, the guide member in said first position forming a passageway through which said recording medium is to be guided to travel along a predetermined path with respect to said platen roller, and

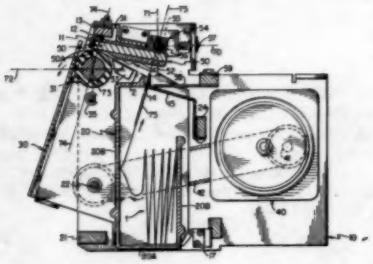
(f) means for coupling said guide member and said thermal print head together so that the guide member is moved to said first position in response to movement of said thermal print head to said inoperative position and is moved to said second position in response to movement of said thermal print head to said operative position.

4,962,388

BIDIRECTIONAL FEED MECHANISM OF A FETAL MONITOR PRINTER

Phillipp J. Quedens, Berlin, and Peter A. Staniforth, Killingworth, both of Conn., assignors to American Home Products Corporation, New York, N.Y.

Filed Apr. 10, 1989, Ser. No. 335,286
Int. Cl.[5] G01D *15/13;* B41J *11/58*
U.S. Cl. 346—136 25 Claims



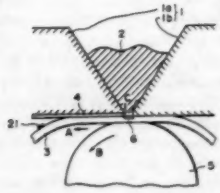
1. A feed apparatus for zigzag paper pack, comprising:
a paper retention pocket having a base and having sidewalls extending into respective planes from said base so that the zigzagpaper pack may be accommodated to stand upright on said base and between said sidewalls, said planes being no wider than the base from which said planes extend;
means for pulling the zigzag paper from the zigzag paper pack out of said paper retention pocket; and
means for directing the zigzag paper from said paper retention pocket to said pulling means and for tensioning the zigzag paper, said directing and tensioning means being arranged between said planes and over said base and above predetermined height to which the zigzag paper is to extend to stand upright on said base.

4,962,389

IMAGE RECORDER USING INK IMPARTED WITH ADHESIVENESS BY ELECTRO-CHEMICAL REACTION

Fumitaka Kan, Tokyo; Yasuyuki Tamura; Naoki Kushida, both of Yokohama; Koichi Tohma; Hiroshi Fukumoto, both of Kawasaki; Toshiya Yuasa, Mituka; Noboru Tohyama, Tokyo, and Norihiko Koizumi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 75,045, Jul. 17, 1987, Pat. No. 4,881,084.
This application Jun. 30, 1989, Ser. No. 374,045
Claims priority, application Japan, Jul. 25, 1986, 61-175191; Sep. 13, 1986, 61-216752; Jan. 9, 1987, 62-001709; Apr. 23, 1987, 62-098590; May 29, 1987, 62-131584
Int. Cl.[5] G01D *15/16;* B41J *2/005;* C09D *11/02*
U.S. Cl. 346—140 R 28 Claims



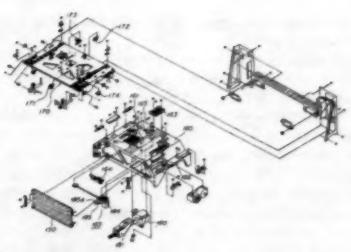
1. A recording apparatus, comprising:
an ink holding means having an ink-supply part and holding a fluid ink so that the fluid ink will contact a transfer-receiving medium moved along the ink-supply part at the ink supply part, wherein said fluid ink is substantially non-adhesive but can be imparted with an adhesiveness by electro-chemical reaction, and
an energy application means for applying a pattern of energy corresponding to a given image signal to the fluid ink at or in the neighborhood of the ink supply part to provide the fluid ink with an adhesive pattern, wherein said energy application means causes said electro-chemical reaction;
whereby at the ink-supply part, the adhesive pattern of the fluid ink is transferred to the transfer-receiving medium to form thereon an ink pattern corresponding to the energy pattern applied.

4,962,390

IMAGE FORMATION APPARTUS HAVING AN OSCILLATING RECORDING HEAD

Shigeru Yoshimura, Yokohama; Tetsuo Suzuki, Kawasaki, and Makoto Takemura, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 49,391, May 13, 1987, abandoned, which is a division of Ser. No. 844,132, Mar. 26, 1986, Pat. No. 4,692,778. This application Mar. 22, 1989, Ser. No. 327,397
Claims priority, application Japan, Mar. 28, 1985, 60-65103; Mar. 28, 1985, 60-65106; Mar. 28, 1985, 60-65108; Mar. 28, 1985, 60-65112; Mar. 28, 1985, 65114; Mar. 28, 1985, 65116; Mar. 28, 1985, 65117; Mar. 28, 1985, 60-65118; Mar. 28, 1985, 60-65119; Mar. 28, 1985, 60-65120; Mar. 28, 1985, 60-65121
Int. Cl.[5] B41J *2/04*
U.S. Cl. 346—140 R 14 Claims



1. An image forming apparatus comprising:
recording means having a recording section for recording an image on a recording medium; and
supporting means for supporting said recording means, wherein said supporting means allows said recording means to oscillate with respect to a reference surface associated with a recording surface of the recording medium during recording of an image thereon so that said supporting means can maintain said recording section of said recording means at a predetermined location with respect to the reference surface,
wherein said supporting means includes a roller member movable with said recording means and a groove engaging said roller member for forming a pivot for the oscillation of said recording means with respect to the reference surface,
wherein said groove includes a portion having a width larger than a diameter of said roller member and a portion having a width as large as the diameter of said roller member, and wherein said larger width portion allows the oscillation.

4,962,391

INK JET PRINTER HEAD

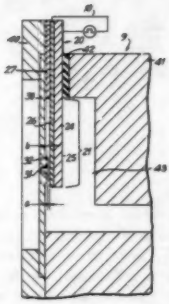
Tsuyoshi Kitahara; Shuji Yonekubo; Hideki Morozumi; Koichi Higashimura, and Masanao Matsuzawa, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Apr. 12, 1989, Ser. No. 336,964

Claims priority, application Japan, Apr. 12, 1988, 63-89372; Jun. 3, 1988, 63-137888; Jun. 23, 1988, 63-155891

Int. Cl.[5] B41V *2/045*

U.S. Cl. 346—140 R **14 Claims**



1. An ink jet print head for ejecting ink onto a recording medium comprising a frame, an ink supply, a nozzle forming substrate supported on the frame and having a plurality of nozzles formed therein, a piezoelectric transducer having a plurality of vibrators thereon, each vibrator being in direct contact with the ink and independently driven, the piezoelectric transducer being supported on the frame so that a vibrator is in facing relationship with the nozzle forming substrate forming a first gap between the vibrator and a region of the nozzle forming substrate adjacent to the nozzle and a second gap formed between the vibrator and a region of the nozzle forming substrate away from the nozzle, the width of the first gap being different from the width of the second gap, the first gap having a width for controlling the pressure generated therein, the second gap having a width for controlling the vibration of each vibrator and ink supply, and the width of the first gap being less than the width of the second gap when the viscosity of the ink is greater than 5 mPaS and the width of the first gap being greater than the width of the second gap when the viscosity of the ink is no greater than 5 mPaS.

4,962,392

THERMAL HEAD SUPPORTING MEANS FOR A THERMAL PRINTING SYSTEM

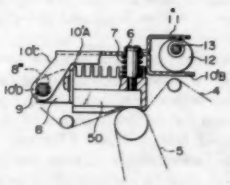
Takeshi Okuno, and Kiyoshige Ishiyama, both of Mie, Japan, assignors to Shinko Denki Kabishiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1989, Ser. No. 411,801

Claims priority, application Japan, Sep. 26, 1988, 63-239066

Int. Cl.[5] G01D *15/00*

U.S. Cl. 346—145 **5 Claims**



1. A thermal head supporting means for a thermal printing system for positioning an ink ribbon and a paper sheet to be printed by clamping them between a platen roller and a thermal head being opposed with each other, which comprises;

a supporting shaft providing a swing axis and attached to both side frames of said thermal printing system by passing through said side frames and in parallel with said platen roller,

a thermal head supporting plate disposed between said supporting shaft and said platen roller for attaching said thermal head to the axially central portion of said supporting shaft and swingably supporting said thermal head about said swing axis in a one-point central support manner so that said thermal head can be depressed against or retracted away from said platen roller,

a thermal head urging lever assembly consisting of, a rear end portion swingably connected to said head supporting plate at two positions spaced apart from each other and interposing said head supporting plate between said two positions, an intermediate portion connected to said thermal head, a forward portion for transmitting a force to urge said thermal head against or separate from said platen roller,

a cam shaft consisting of, a cam engaging said force transmitting portion of said thermal head urging lever assembly and a shaft to be journally received in a predetermined position of said frame,

a driving motor for rotating said cam shaft and equipped with at least a switch means for starting or stopping said driving motor, and

a guide post connecting both said central portion of said thermal head and said thermal head urging lever assembly,

thereby a force urging said thermal head to depress against or retract away from said platen roller is applied through said guide post in a one-point central manner and the region applied with said urging force is limited within the transverse width of said thermal head urging lever assembly less than the span of said both side frames of said thermal printing system.

4,962,393

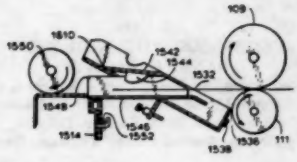
PRINTING APPARATUS

Alfred L. Fulton; William L. Smallwood, both of Huntsville, and James A. Feemster, Arab, all of Ala., assignors to SCI Systems, Inc., Huntsville, Ala.

Filed May 12, 1988, Ser. No. 193,747

Int. Cl.[5] G01D *15/00*

U.S. Cl. 346—150 **18 Claims**



1. A portable apparatus for collecting and storing the output from a document printer having an enclosure with an outlet opening, said apparatus comprising, in combination:

(a) a portable bin comprising a housing having an inlet opening, said housing being adapted to store the printed documents output from said printer through an outlet opening;

(b) guide means for guiding documents output from said printer through said outlet opening into said housing through said inlet opening; and

(c) means for releasably securing said housing to said printer with said inlet and outlet openings in document transfer alignment with one another.

4,962,394

TONER DENSITY CONTROL DEVICE FOR AN IMAGE RECORDER

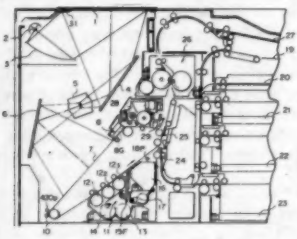
Norimasa Sohmiya, Soka; Yasushi Koichi, Yamato, and Kazunori Karasawa, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 30, 1989, Ser. No. 330,480

Claims priority, application Japan, Apr. 1, 1988, 63-80953; Apr. 11, 1988, 63-88462

Int. Cl.[5] G01D *15/00*

U.S. Cl. 346—160.1 7 Claims



1. A toner density control device for an image recorder which develops an electrostatic latent image of a predetermined pattern formed on an image carrier by using a toner of a developer which is stored in a developing device, comprising:

pattern density sensor means for sensing density of a developed image of the predetermined pattern;

toner density sensor means for sensing toner density of the developer;

toner supply means for supplying toner to said developing device;

commanding means for commanding an amount of shift of the density of the image; and

control means for setting a toner density basis in association with the density of the image sensed by said pattern density sensor means and controlling said toner supply means in response to the amount of shift commanded by said commanding means, the set toner density basis and the toner density sensed by said toner density sensor such that said toner supply means is activated to supply toner to said developing device only when the sensed density of the image is lower than density represented by a sum of the toner density basis and the commanded amount of shift.

4,962,395

LIQUID LEVEL SENSOR WITH WIDE TEMPERATURE RANGE CAPACITY

Alistair R. W. Baird, Scotland, United Kingdom, assignor to Honeywell Control Systems Limited, United Kingdom

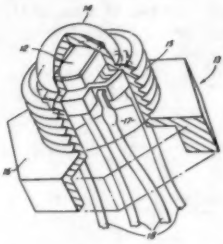
Filed Dec. 6, 1988, Ser. No. 280,626

Claims priority, application United Kingdom, Dec. 11, 1987, 8729038

Int. Cl.[5] G08B *21/00*

U.S. Cl. 340—619 21 Claims

1. A liquid sensor characterised by a semiconductor light source and a semiconductor light detector mounted on a common support means, an optical element of hemispherical, or generally hemispherical shape, the light source and the light detector being located on a plane parallel to and closely spaced to a major plane of the optical element said major plane constituting a cross-section of substantially maximum area of the optical element and in a base region thereof and the light source and light detector being located in a straight line passing through a symmetry axis of the optical element and parallel to a diameter of a circle described by the optical element in its major plane, the light source and light detector being located on said straight line at different distances from an intersection point with said symmetry axis of the optical element, whereby the optical element is able to receive light output from the light source and to transmit the light towards an arcuate exterior boundary of the optical element, and the optical element is also



able to transmit light which is reflected at said arcuate exterior boundary in the absence of liquid at the exterior of the optical element and to direct it towards an inlet port of the light detector, the sensor comprising enclosed, gas-filled cavity means to accommodate the light source and detector.

4,962,396

SINGLE LOCK SWITCH FOR INPUTTING COMMANDS ASSOCIATED WITH SHOOTING IN MOVIE CAMERA

Kozo Kokubun, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 13, 1988, Ser. No. 284,007

Claims priority, application Japan, Dec. 22, 1987, 62-322769

Int. Cl.[5] G03B *1/00*

U.S. Cl. 352—174 11 Claims

1. A switch, operable by a single finger of the operator, for use in a movie camera for entering commands for starting and ending shooting, comprising:

a movable member having a pressing surface which may be pressed in a first direction by an operator of said camera and being movable when said pressing surface is pressed;

a resilient member constantly biasing said movable member in a second direction opposite to the first direction and maintaing said movable member in a first position;

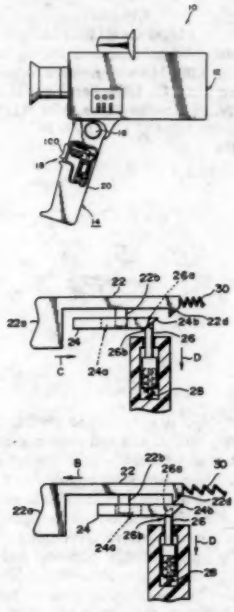
a retaining member for retaining said movable member in a second position;

an unlocking member, connected to said movable member and moveable with said movable member in said first direction, said unlocking member being operative to said second position by further movement of said movable member in said first direction to release said movable member from said retaining member and

switch means for entering the commands in said camera;

said switch means entering a shoot command in said camera when said movable member is moved from the first position to a third position in the first direction;

when said movable member is moved to the second position, said retaining member is operative to retain said movable



member in the second position and to cause said switch means to be continuously entering the shoot command.

4,962,397

DATA INPUT/OUTPUT DEVICE FOR A CAMERA

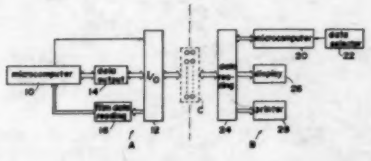
Norio Ishikawa, Osaka, and Toshihiko Ishimura, Habikino, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 243,174, Sep. 8, 1988, Pat. No. 4,887,105, which is a continuation of Ser. No. 127,556, Dec. 1, 1987, abandoned, which is a continuation of Ser. No. 53,553, May 21, 1987, abandoned, which is a continuation of Ser. No. 881,280, Jul. 2, 1986, abandoned. This application Sep. 22, 1989, Ser. No. 410,960

Claims priority, application Japan, Jul. 4, 1987, 60-147215

Int. Cl.[5] G03B *7/24*

U.S. Cl. 354—21 **7 Claims**



1. A data input/output device for a camera, comprising:

a group of terminals electrically contactable at least with code patterns representing film data and formed on a film cartridge surface, one of said terminals receiving as an input a control signal;

reading means for reading the film data input through said group of terminals;

data output means for outputting camera data;

changeover means connected to said group of terminals, said reading means connected to said group of terminals, said reading means and said data output means for changing-over data input/output operations between a first mode wherein the film data is input through said group of terminals and a second mode wherein the camera data is output to said group of terminals; and

control means for controlling the operation of said changeover means based on the control signal to selectively carry out the film data reading operation by said reading means and the camera data output operation by said data output means.

4,962,398

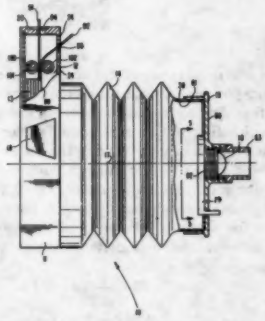
DISPOSABLE CAMERA WITH COLLAPSIBLE BELLOWS

James D. Sorg, 1709 Queensbridge Dr., Indianapolis, Ind. 46219, and James R. Reed, Indianapolis, Ind., assignors to James D. Sorg, Indianapolis, Ind.

Filed Jul. 27, 1989, Ser. No. 385,829

Int. Cl.[5] G03B *17/50*

U.S. Cl. 354—86 **11 Claims**



9. A disposable camera for holding a self-developing film packet comprising:

a main frame including a hollow interior for holding a self-developing film packet with developing medium;

pressure means mounted in said frame for applying pressure to exposed film from said film packet to spread said developing medium across said exposed film;

a lens;

camera bellows having a distal end forming an aperture with said lens thereat, said bellows having a cylindrical wall and first annular portions and second annular portions integrally joined together in alternating fashion, said first annular portions and second annular portions collapsible by moving said first annular portions to overlie and contact adjacent second annular portions but repeatably erectable to the same preset focal distance along a camera axis extending between said aperture and film packet whenever said camera bellows is erected, said cylindrical wall has outer cylindrical fold rings and inner cylindrical fold rings joining together said first annular portions and said second annular portions, said inner cylindrical fold rings each include a first wall and a second wall each arranged perpendicular to said camera axis with inner end portions integrally joined together about an inner diameter and outer end portions integrally joined respectively to adjacent first annular portions and second annular portions; and,

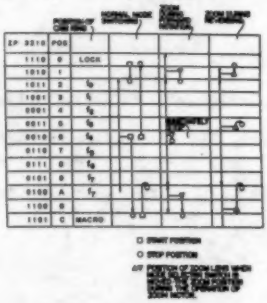
shutter means operatively associated with said lens operable to open and close said aperture.

4,962,399

ZOOM LENS DRIVING APPARATUS

Norio Numako, and Takeo Kobayashi, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 301,594, Jan. 26, 1989, abandoned. This application Dec. 20, 1989, Ser. No. 455,791
Claims priority, application Japan, Feb. 3, 1988, 63-23547
Int. Cl.[5] G03B 3/10
U.S. Cl. 354—195.1 32 Claims



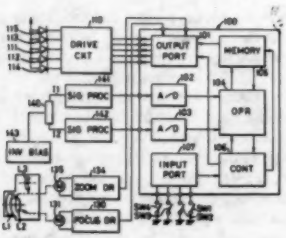
1. A zoom lens driving apparatus adapted for use in a camera having a zoom lens and a mode selection means, said apparatus including a first driving means for moving the zoom lens in an optical axis direction within a zooming range, and a second driving means for selectively moving the zoom lens in and out of the zooming range in accordance with a selection mode selected by the mode selection means, the driving apparatus further comprising a zoom lens driving apparatus which comprises means for varying the speed of the movement of the zoom lens between the first driving means and the second driving means.

4,962,400

ZOOMING CONTROL DEVICE FOR CAMERA

Tadashi Otani, Tokyo; Hiroshi Meguro, Kawasaki, and Toru Kosaka, Zama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Mar. 21, 1989, Ser. No. 326,684
Claims priority, application Japan, Mar. 26, 1988, 63-72623
Int. Cl.[5] G03B 1/18
U.S. Cl. 354—195.1 8 Claims



7. A photographic control device, comprising:

means for determining the presence of an object at a plurality of positions in an object area;

discriminating means responsive to said determining means for discriminating whether an image of the object will be within a photographic frame for a given photographic magnification; and

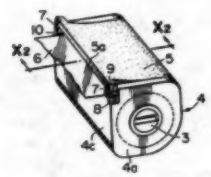
means responsive to said discriminating means for selecting a magnification so that the image is within said photographic frame.

4,962,401

FILM CARTRIDGE

Koichi Takahashi, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 10, 1989, Ser. No. 321,380
Claims priority, application Japan, Mar. 11, 1988, 63-57785
Int. Cl.[5] G03B 17/26
U.S. Cl. 354—275 10 Claims



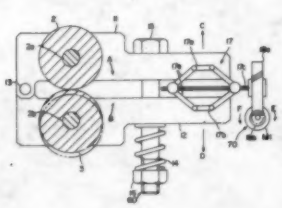
1. A photographic film cartridge comprising: a cartridge case having a longitudinal axis and opposing end walls; a spool extending substantially coaxially with respect to said cartridge case, said spool being carried at opposite end portions of the spool by said opposing end walls of said cartridge case for rotation about a longitudinal axis of the spool, said cartridge case including a flexible wall portion having an axially extending substantially straight edge portion, said cartridge case further including a rigid edge portion for cooperation with said straight edge portion, said flexible wall portion being deflectable between a closed position wherein said straight edge portion is engaged with said rigid edge portion to provide a substantially light-tight seal and an open position wherein said straight edge portion is spaced apart from said rigid edge portion to provide an axially extending film outlet slit opening between said edge portions.

4,962,402

PRESSURE DEVICE FOR USE IN IMAGE FORMING APPARATUSES

Yoshiaki Ibuchi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 25, 1989, Ser. No. 411,673
Claims priority, application Japan, Sep. 26, 1988, 63-125524[U]
Int. Cl.[5] G03B 27/32, 27/52
U.S. Cl. 355—27 3 Claims



1. A pressure device for use in image forming apparatuses comprising:

a pair of pressure rollers by which a media sheet with microcapsules encapsulating a colorless dye and a light-curable agent which hardens by exposure to light is pressed together with an image receiving sheet with a developing agent having a chromogenic effect on said colorless dye

after said media sheet is exposed to an image-forming light,

a pair of guides by which the pair of rollers are rotatably supported, the pair of guides being rotatable at one end relative to each other about a fulcrum,

a roller-pressing means that is installed through said guides, said roller-pressing means pressing the pair of rollers to be pressed against each other, and

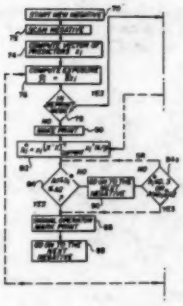
a pressure changing means that is installed on both the guides, said pressure-changing means changing pressure to be applied to said rollers by said roller-pressing means according to the length of said image receiving sheet that is measured in the direction perpendicular to the transporting direction of said image receiving sheet.

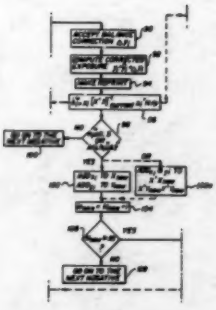
4,962,403

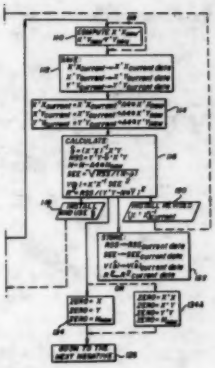
ADJUSTING PHOTOGRAPHIC PRINTER COLOR EXPOSURE DETERMINATION ALGORITHMS

Robert M. Goodwin, and Joseph A. Manico, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 11, 1989, Ser. No. 448,798
Int. Cl.[5] G03B *27/80*
U.S. Cl. 355—38 **7 Claims**







1. A method of controlling the exposure of negatives in a photographic printer, comprising the steps of:

(a) scanning each negative to provide red, green and blue density information;

(b) producing prints of such negatives employing such density information in a color exposure determining algorithm having at least one neutral density equations with coefficients and at least two chromaticity equations with coefficients;

(c) computing a statistic from each negative's density data based on the diagonal element from the algorithm's hat matrix;

(d) alerting the operator that a negative should be critically reprinted whenever its computed statistic lies within an adjustable "selection" range;

(e) automatically identifying the prints made from the negatives whose computed statistics lies within the "selection" range;

(f) selecting the identified prints and providing precise density and color balance corrections;

(g) reprinting negatives from the selected identified prints using the precise corrections;

(h) automatically examining all reprinted negatives for suitability of use for recalculating the algorithm's coefficients and selecting those negatives which lie in one adjustable and one nonadjustable range for the hat statistic;

(i) computing the X'X, the X'Y and X'Y matrices for all the selected negatives;

(j) adding an adjustable fraction of the new X'X, the new X'Y, and the new Y'Y matrices tot he corresponding current matrices and recomputing the algorithm coefficients, b, when the number of new frames exceeds an adjustable number;

(k) installing and using the new coefficients in the corresponding equations; and

(l) using the newly formed X'X matrix to continue to compute the hat statistic and begin to accumulate new values for the new X'X, the new X'Y and the new Y'Y matrices.

4,962,404

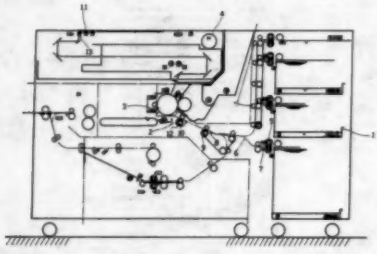
COPYING MACHINE

Takahiro Wakikaido, and Tsukasa Sugiyama, both of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Nov. 22, 1989, Ser. No. 440,599
Claims priority, application Japan, Nov. 26, 1988, 63-299235
Int. Cl.[5] G03B *27/48, 27/50, 27/70*; G03G *21/00*
U.S. Cl. 355—51 **6 Claims**

1. A copying machine so composed that copying paper can be consecutively fed from the stock section thereof regardless

of the movemental timing of the resist section thereof characterized by that the paper feeding speed or the paper feeding



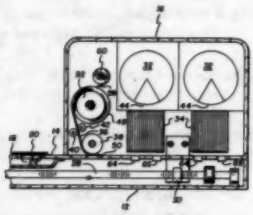
interval of the copying paper can be controlled in response to the relative scanning time of the optical system for a document.

4,962,405

COMPACT CONTACT PRINTER WITH A FLEXIBLE TRANSPARENT COVER SHEET

Robert S. Jones, and John J. Maurer, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 17, 1989, Ser. No. 438,822
Int. Cl.[5] G03B *27/10, 27/20*
U.S. Cl. 355—84 **14 Claims**



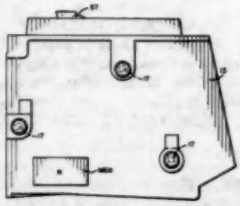
1. In a contact printer comprising means for supporting a film and an original in superposed relationship, means for providing a source of light for exposing said film through said original, and means for moving said light over the surface of said superposed film and original, the improvement comprising means carried by said light moving means for covering said superposed film and original with a substantially impervious flexible and transparent cover sheet member as said exposing light is scanned across said film and original whereby said film is exposed by said light through said cover sheet and said original.

4,962,406

COMPACT DC/AC CIRCUIT BREAKER WITH COMMON ARC EXTINGUISHING CAPABILITY

Roger E. Walker, Franklin Township, Beaver County, and Richard J. Pentz, Beaver, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 26, 1989, Ser. No. 457,048
Int. Cl.[5] H01H *9/30*
U.S. Cl. 335—201 **7 Claims**



1. A circuit breaker including: an insulating housing, separable electrical contacts within the housing and a mechanism for actuating said contacts relative to one another under a command for electrical breaking through the mechanism; the housing having two opposite side-walls; the contacts being centered for relative movement in a central plane parallel to said sidewalls;

with the provision of at least one U-shaped member of ferromagnetic material defined by two opposite outer lateral surfaces and two opposite inner lateral surfaces, said U-shaped member being disposed in the housing with said outer lateral surfaces being mounted adjacent to the corresponding sidewalls of the housing and with said inner lateral surfaces being symmetrically placed on opposite sides of said central plane, whereby said U-shaped member defines about said parallel plane a common arcing region for the arc generated by said contacts when separating;

one magnet being mounted upon one of said sidewalls of the housing, said magnet having a polar area substantially equal to the area laterally projected upon said sidewall by said common arcing region, and said magnet having a polar orientation so selected in relation to the electric arc as to generate across said arcing region a magnetic field effective to have a quenching effect when the circuit breaker is operating under a DC voltage;

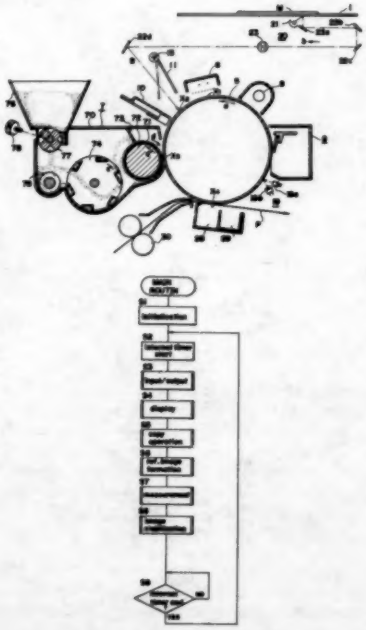
whereby the circuit breaker is operable with an AC voltage under said U-shaped member, and with a DC voltage under said magnet.

4,962,407

ELECTROPHOTOGRAPHIC COPYING APPARATUS HAVING TONER IMAGE DENSITY MEASURING ARRANGEMENT FOR DETECTING TONER CONCENTRATION

Masahide Ueda, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 8, 1988, Ser. No. 179,381
Claims priority, application Japan, Apr. 11, 1987, 62-89308
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—208 **16 Claims**



1. An electrophotographic copying apparatus comprising: a photosensitive member;

charging means for charging the surface of said photosensitive member;

exposure means for exposing the charged surface of said photosensitive member to light so as to form an electrostatic latent image thereon;

developing means for developing the electrostatic latent image by a developer incorporating toner and carrier;

means for forming two reference toner images having different electric potential on the surface of said photosensitive member by operating said charging means under different conditions so as to cause the two reference toner images to have different densities;

measuring means for optically measuring the densities of the two reference tones images formed on the surface of said photosensitive member;

detecting means for detecting toner concentration in the developer based on the difference of the two reference toner image densities measured by said measuring means; and

supply means for supplying toner to the developer when the toner concentration detected by said detecting means is less than a specified value.

4,962,408

DEVICE FOR REMOVING DEFECTIVE DEVELOPER AGENT FROM A DEVELOPING UNIT OF AN IMAGE FORMATION APPARATUS

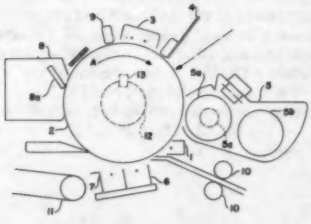
Jitsuo Masuda, Yamatotakada; Junji Morimoto, Yamatokoriyama; Ken Yamagishi, Yamatotakada; Hiroshi Kinashi, Uji; Itaru Kawabata, Kashiwara, and Teruhiko Noguchi, Sakai, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 22, 1988, Ser. No. 185,027

Claims priority, application Japan, Apr. 23, 1987, 62-100261; May 1, 1987, 62-109572

Int. Cl.[5] G03G *15/06, 21/00*

U.S. Cl. 355—245 **4 Claims**



1. An image formation apparatus for removing a defective developing agent of a first polarity accumulated during the formation of electrostatic latent images, comprising:

a photoreceptor having a surface for receiving electrostatic latent images;

a developing unit containing a developing agent to be applied to the surface of said photoreceptor;

counting means for counting the number of image formation processes that are performed by the apparatus;

reverse polarity charging means for charging the surface of said photoreceptor to a second polarity opposite from said first polarity and attracting the defective developing agent of the first polarity from said developing unit in response to said counting means counting that a predetermined number of image formation processes have been performed; and

cleaning means for removing the defective developing agent of the first polarity from the surface of said photoreceptor.

4,962,409

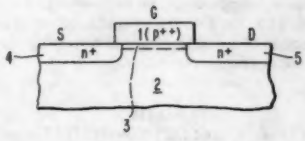
STAGGERED BANDGAP GATE FIELD EFFECT TRANSISTOR

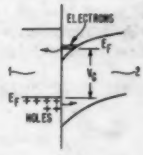
Paul M. Solomon, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 198,727, May 24, 1988, abandoned, which is a continuation of Ser. No. 5,069, Jan. 20, 1987, abandoned. This application Feb. 16, 1990, Ser. No. 483,289

Int. Cl.[5] H01L *29/161, 29/80*

U.S. Cl. 357—22 **5 Claims**





1. A field effect transistor comprising in combination

a first semiconductor material member

having source and drain regions separated by a channel region,

a second semiconductor material gate member of higher conductivity than said first semiconductor material positioned contiguous with and forming a heterojunction with said channel region,

the valence band edge of said second semiconductor material gate member and the conduction band edge of said first semiconductor material being disposed opposite the forbidden gaps of said first semiconductor material member and said second semiconductor material gate member, respectively.

4,962,410

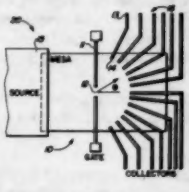
QUADFET-A NOVEL FIELD EFFECT TRANSISTOR

Alfred M. Kriman, Tempe, Ariz., and Gary H. Bernstein, South Bend, Ind., assignors to Arizona Board of Regents, Tempe, Ariz.

Filed Aug. 4, 1989, Ser. No. 389,760

Int. Cl.[5] H01L *29/80*

U.S. Cl. 357—22 **15 Claims**



1. A novel quantum diffraction field effect transistor which exploits the phenomenon of electron diffraction to produce novel electrical characteristics comprising: a first layer, said first layer being a thin, uniform planar layer of a first type of semiconductive material having an upper surface, a lower

surface and opposing ends; a second layer of a second type of semiconductive material; conducting channel means separating said first and second layers of dissimilar semiconductor materials; gate means received and positioned within a central portion of said upper surface of said first layer and communicating with said channel means, said gate means comprising a Shottky metal having a first, centrally disposed slit; a source electrode disposed at one end of the upper surface of said first layer; a drain electrode disposed at the opposing end of the upper surface of said first layer, said drain comprising a series of spaced-apart, forward-biased Schottky contacts or fingers having outwardly disposed tips, said tips arranged on an arc of a circle centered at the slit, so that said source and drain perform the function of the light source and viewing screen of an analogous optical system, respectively.

4,962,411

SEMICONDUCTOR DEVICE WITH CURRENT DETECTING FUNCTION

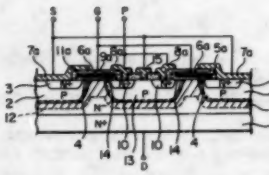
Norihito Tokura, Aichi; Hironari Kuno; Hiroyasu Ito, both of Kariya; Hirohiko Saito, Obu, and Kunihiko Hara, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 28,318, Mar. 20, 1987, abandoned. This application Feb. 3, 1989, Ser. No. 307,177

Claims priority, application Japan, Mar. 21, 1986, 60-64511; Feb. 6, 1987, 61-26969

Int. Cl.[5] H01L *29/78, 29/72, 29/34*

U.S. Cl. 357—23.4 **15 Claims**



1. A semiconductor device with means for detecting current flow through the device, comprising:

a semiconductor substrate of a first conductivity type having first and second surfaces with drain and source electrodes, respectively;

a first diffusion layer of a second conductivity type formed in a predetermined portion of said semiconductor substrate on the second surface side in the semiconductor substrate leaving a remaining portion of said semiconductor substrate;

a second diffusion layer of the first conductivity type formed in the first diffusion layer of the second conductivity type and electrically connected to the source electrode;

a gate electrode formed with an insulating film on the second surface of the substrate for controlling a current channel through the first diffusion layer in the vicinity of the second surface between said remaining portion of said semiconductor substrate of said first conductivity type and said second diffusion layer thereby configuring a vertical MISFET;

means for controllably causing electric current to flow between the drain and source electrodes through the current channel; and

current flow detecting means for detecting a signal representative of a source-drain current of said MISFET comprising a probe region of a third diffusion layer of the first conductivity type formed in the remaining portion of the substrate, and a probe electrode spaced from the first diffusion layer of the second conductivity type on the second surface side of the substrate and in electrical contact with the probe region.

4,962,412

PHOTOELECTRIC CONVERSION APPARATUS WITHOUT ISOLATION REGIONS

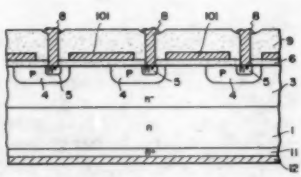
Mahito Shinohara, Tokyo; Shigetoshi Sugawa, Atsugi; Seiji Hashimoto, Yokohama, and Mamoru Miyawaki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 149,082, Jan. 27, 1988, abandoned. This application Jan. 29, 1990, Ser. No. 470,407

Claims priority, application Japan, Jan. 29, 1987, 62-17150; May 11, 1987, 62-112290; May 22, 1987, 62-123872; May 26, 1987, 62-126888

Int. Cl.[5] H01L *27/14*

U.S. Cl. 357—30 **19 Claims**



1. A photoelectric conversion apparatus comprising:

an array of plural photoelectric conversion cells each comprising a first transistor having a charge accumulation region for accumulating carriers generated by photoexcitation thereof; and

plural second transistors, each of said second transistors being a gate-insulated transistor having first and second main electrode areas and a control electrode region, said main electrode areas of each said second transistor being defined by said charge accumulation regions of two respective neighboring ones of said photoelectric conversion cells.

4,962,413

ANALOG SWITCH WITH MINIMIZED NOISE ASCRIBABLE TO GATE CAPACITANCE

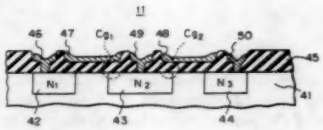
Seiichi Yamazaki; Hiroaki Inoue; Sumihiro Takashima, and Hiroshisa Shishikura, all of Tokyo, Japan, assignors to Oki Electric Industry Co, Ltd., Tokyo, Japan

Filed Aug. 9, 1988, Ser. No. 230,234

Claims priority, application Japan, Aug. 14, 1987, 62-202968

Int. Cl.[5] H01L *27/02*

U.S. Cl. 357—42 **15 Claims**



1. A semiconductor device comprising:

a semiconductor substrate having a surface;

an n-channel MOSFET device and a p-channel MOSFET device formed at said surface of said semiconductor substrate;

each of said n-channel MOSFET device and p-channel MOSFET device comprising:

first, second and third diffused regions formed in said surface of said semiconductor substrate and arranged in a line in a first direction, each of said first, second and third diffused regions having opposite side portions extending substantially parallel to each other in a second direction perpendicular to said first direction, and each having substan-

tially a same width extending along said opposite side portions in said second direction;

said first diffused region being spaced from said second diffused region by a first distance to form a first channel region therebetween;

said second diffused region being spaced from said third diffused region by a second distance to form a second channel region therebetween;

a first gate electrode formed along a surface of a first gate insulating layer overlaying said first channel region, said first gate electrode having opposite side portions extending parallel to each other in said second direction;

a second gate electrode electrically connected to said first gate electrode and formed along a surface of a second gate insulating layer overlaying said second channel region, said second gate electrode having opposite side portions extending parallel to each other in said second direction;

wherein one of said opposite side portions of said first gate electrode extends over one of said opposite side portions of said second diffused region by a third distance in said first direction, and wherein one of said opposite side portions of said second gate electrode extends over the other of said opposite side portions of said second diffused region by a fourth distance in said first direction;

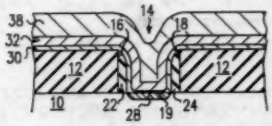
wherein a length defined by the sum of said third and fourth distances is substantially a same for each of said n-channel MOSFET device and p-channel MOSFET device.

4,962,414

METHOD FOR FORMING A CONTACT VIA

Fu-Tai Liou, Carrollton; Robert O. Miller, The Colony; Mohammed M. Farohani, Carrollton, and Yu-Pin Han, Dallas, all of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Continuation of Ser. No. 154,868, Feb. 11, 1988, abandoned.
This application Jun. 8, 1989, Ser. No. 366,194
Int. Cl.[5] H01L *23/48*
U.S. Cl. 357—71 **2 Claims**



1. In an integrated circuit, a structure for connecting a first level silicon conductor and a second level metal conductor separated by an insulating layer, comprising:

an opening having substantially vertical sidewalls and extending through the insulating layer, wherein a portion of the first level conductor is exposed in the opening;

a titanium silicide layer covering the exposed portion of the first level conductor;

a titanium nitride layer covering said titanium silicide layer, the sidewalls of said opening, and a portion of an upper surface of the insulating layer; and

a conformal conductor layer of tungsten disilicide having a substantially uniform thickness and overlying all of said titanium nitride layer;

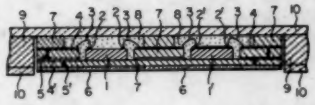
wherein the second level conductor overlies said conformal conductor layer above the insulating layer, wherein a conducting connection is made from the first level conductor through said titanium silicide layer, through said titanium nitride layer, and through said conformal layer, to said second level conductor.

4,962,415

IC CARD

Hiroshi Yamamoto; Ryutaro Arakawa, and Akio Anada, all of Ibaraki, Japan, assignors to Hitachi Maxell, Ltd., Ibaraki, Japan

Continuation of Ser. No. 131,441, Dec. 11, 1987, abandoned.
This application Feb. 6, 1990, Ser. No. 477,197
Claims priority, application Japan, Dec. 15, 1986, 61-296715
Int. Cl.[5] H01L *23/12, 23/04, 23/14, 23/28*
U.S. Cl. 357—74 **18 Claims**



1. An IC card for transmitting and receiving signals to and from an external apparatus, said IC card including a card-type base having therein a window, a module disposed in said window, and resin provided in a space defined between said module and said window in said card-type base, said module further comprising:

a film substrate having an aperture and top and bottom surfaces;

an IC chip located in said aperture, said IC chip having top and bottom surfaces;

a reinforcing plate supporting said film substrate and said IC chip;

a wiring formed on the stop surface of said film substrate;

external contact terminals incorporated integrally with said wiring to permit connection to said external apparatus; and

bonding leads extending from said wiring toward said aperture in said film substrate,

wherein said IC chip is arranged so that the bottom surface of said IC chip is located on said reinforcing plate and adjacent to said bottom surface of said film substrate, wherein said reinforcing plate is bonded to said bottom surface of said film substrate so as to cover said aperture in said film substrate, and wherein said module is embedded in said resin so that said external connecting terminals are exposed at least in part, externally from said card-like base and, further wherein said reinforcing plate is comprised of a sheet material having a thickness of 0.1 to 0.5 mm, wherein said IC chip has a thickness of 200 to 350 μm and wherein said film substrate has a thickness of 50 to 250 μm.

4,962,416

ELECTRONIC PACKAGE WITH A DEVICE POSITIONED ABOVE A SUBSTRATE BY SUCTION FORCE BETWEEN THE DEVICE AND HEAT SINK

Alan L. Jones, Endwell, and Keith A. Synder, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 18, 1988, Ser. No. 182,639
Int. Cl.[5] H01L *23/36, 23/40*
U.S. Cl. 357—81 **30 Claims**

1. An electronic package comprising:

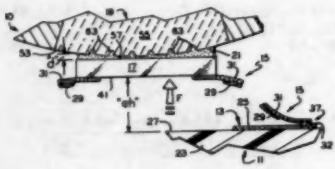
a first circuitized substrate having at least one layer of circuitry thereon;

a second circuitized substrate of flexible nature including at least one layer of circuitry thereon electrically connected to said first circuitized substrate;

an electronic device having first and second opposing surfaces, said circuitry on said second, flexible circuitized substrate being connected to designated locations on said second opposing surface of said device, said device being oriented in a spaced, elevated position from said first circuitized substrate;

a heat sink member including a surface facing said electronic device; and

a predetermined quantity of liquid material positioned between and in contact with both said first surface of said electronic device and said surface of said heat sink mem-



ber facing said device, said material possessing a surface tension sufficient to create a suction force between said electronic device and said heat sink member to maintain said electronic device in said spaced, elevated relationship from said first circuitized substrate during operation of said electronic package.

4,962,417

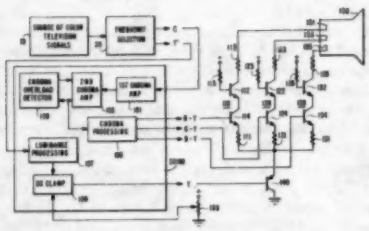
CHROMA OVERLOAD DETECTOR USING A DIFFERENTIAL AMPLIFIER

Mark A. Schultz, New Palestine, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed May 12, 1988, Ser. No. 193,549

Int. Cl.[5] H04N *9/68*

U.S. Cl. 358—27 **10 Claims**



1. A chroma overload detector, comprising:

an input terminal for receiving chrominance signals;

means for generating a predetermined threshold voltage level; and

differential amplifier means having a first input coupled to said input terminal, a second input coupled to said threshold voltage level generating means, and an output;

said differential amplifier means producing at said output an output voltage proportional to the difference between the magnitude of said chrominance signals and said threshold voltage level when said magnitude of said chrominance signals exceeds said threshold voltage level.

4,962,418

COLOR PICTURE DISPLAY APPARATUS

Ryuichi Kamaga, Utsunomiya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 30, 1988, Ser. No. 213,827

Claims priority, application Japan, Jun. 30, 1987, 62-160899; Jun. 24, 1988, 63-154879

Int. Cl.[5] H04N *9/73*

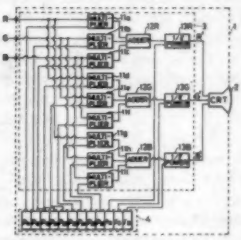
U.S. Cl. 358—29 **8 Claims**

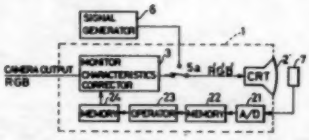
1. A color picture display apparatus, comprising:

display means for displaying a picture on the basis of picture signals picked up by an optoelectronic device:

detecting means, arranged in front of the display means, for detecting luminous characteristics of the display means with reference to reference color signals for reference colors;

processing means for processing the luminous characteristics of the display means and ideal luminous characteristics of an ideal display to obtain correction values; and





correcting means for correcting the picture signals on the basis of the correction values to obtain corrected picture signals to be fed to the display means for displaying a corrected picture;

the luminous characteristics of the display means including chromaticity and luminance, the ideal luminous characteristics of the ideal display including the chromaticity and reference white chromaticity.

4,962,419

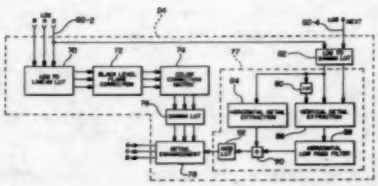
DETAIL PROCESSING METHOD AND APPARATUS PROVIDING UNIFORM PROCESSING OF HORIZONTAL AND VERTICAL DETAIL COMPONENTS

Robert H. Hibbard, Fairport; Kenneth A. Parulski, and Lionel J. D'Luna, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 13, 1989, Ser. No. 310,456

Int. Cl.[5] H04N *9/64*

U.S. Cl. 358—37 **12 Claims**



1. Detail processing apparatus for improving the detail components of an image signal, the apparatus being part of a signal processing network in which separate luminance and chromi-

nance signals are corrected for colorimetric errors in a correction matrix and compensated for contrast non-linearity in a gamma correction stage, said detail processing apparatus comprising:

means for converting the un-matrixed luminance signal to a gamma-corrected luminance signal;

a vertical high pass filter for filtering the un-matrixed, gamma-corrected luminance signal and separating therefrom a vertical detail signal representative of vertical components of the image;

a horizontal low pass filter for filtering the vertical detail signal for horizontal variations caused by diagonal components of the image and generating therefrom a filtered vertical detail signal;

a horizontal high pass filter for filtering the un-matrixed, gamma-corrected luminance signal and separating therefrom a horizontal detail signal representative of horizontal components of the image;

means for modifying the filtered vertical and the horizontal detail signals by a process having a transfer characteristic that is related to the signal level of image detail; and

means for combining the modified detail signals with the matrixed, gamma-corrected image signals whereby the extra:ted detail bypasses the color correction matrix and is inserted into the signal channel after gamma correction, the various detail components obtaining substantially the same visual enhancement regardless of orientation or density in the image.

4,962,420

ENTERTAINMENT VIDEO INFORMATION SYSTEM HAVING A MULTIPLANE SCREEN

Gennady I. Judenich, Moscow, U.S.S.R., assignor to Teatr Polifonicheskoi Dramy, Moscow, U.S.S.R.

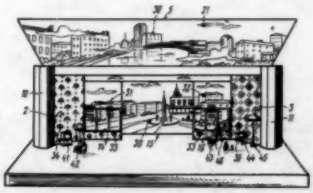
PCT No. PCT/SU87/00046, § 371 Date Jan. 15, 1988, § 102(e) Date Jan. 15, 1988, PCT Pub. No. WO87/07173, PCT Pub. Date Dec. 3, 1987

PCT Filed Apr. 23, 1987, Ser. No. 174,989

Claims priority, application U.S.S.R., May 19, 1986, 4076152

Int. Cl.[5] H04N *9/31*; A63J *1/02*; B24B *19/00*; G03B *21/00*

U.S. Cl. 358—60 **18 Claims**



1. A video information system comprising a multisectional screen (1) having three cells (2, 3, 4) for receiving and displaying dedicated information sent by at least one projector (69) to a selected combination of the cells, wherein at least two cells (2–4) of said multisectional screen (1) are movable in space in at least one direction and form at least one three-dimensional multi-plane screen system capable of varying in space, a first cell being a transverse cell (4) located at the top of and across said multisectional screen (1) and being rotatable about an axis (8) arranged parallel to an upper edge of the multisectional screen (1), the other two cells being longitudinal cells (2, 3).

9. A video information system comprising a multisectional screen (12) having at least four cells (2–4, 14–16) for receiving and displaying dedicated information sent by at least one projector to a selected combination of the cells, wherein at least two cells (2–4, 14–16) of the multisectional screen (12) are movable in space in at least one direction and form at least one three-dimensional multi-plane screen system capable of varying in space, a first cell being a transverse cell (4) located at the top of and across the entire multisectional screen (12) and being rotatable about an axis (8) arranged along an upper edge of the multisectional screen (12), other cells (2–3, 14–16) being longitudinal cells.

17. A video information system comprising a multi-sectional screen having at least two cells for receiving and displaying dedicated information sent by at least one projector to a selected combination of the cells, wherein at least two cells of the multisectional screen are movable in space in at least one direction and form at least two three-dimensional multi-plane screen systems arranged parallel to one another, one after another, and capable of varying in space.

4,962,421

COLOR IMAGE GENERATING APPARATUS

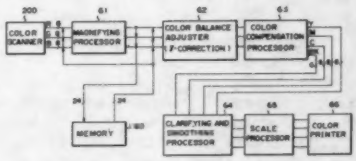
Kazuo Murai, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 10, 1988, Ser. No. 269,696

Claims priority, application Japan, Nov. 11, 1987, 62-284675

Int. Cl.[5] H04N *1/46*

U.S. Cl. 358—76 **8 Claims**



1. A device for adjusting a color balance of an image to be printed, used in an image generating apparatus, comprising:

a switching means for switching an operation mode of said image generating apparatus between a test print mode and a normal print mode;

a memory means for memorizing an image signal relating to at least a part of an original image when said switching means selects said test print mode;

an output means for reading said memorized image signal from said memory means and repeatedly outputting said image signal a plurality of times;

an image processing means for receiving another image signal relating to said original image when said switching means selects said normal print mode and for receiving said outputted image signal when said switching means selects said test print mode, and for processing one signal of said received another image signal and said received image signal, with a different print condition at each time when said output means outputs repeatedly said image signal; and

an image generating means for receiving said processed one signal and for generating said image to be printed in accordance with said received one signal.

4,962,422

STEREOSCOPIC IMAGE DISPLAY APPARATUS

Fumio Ohtomo; Hiroyuki Frusho, and Hitoshi Ohtani, all of Tokyo, Japan, assignors to Kabushiki Kaisha TOPCON, Tokyo, Japan

Filed Jun. 9, 1989, Ser. No. 363,763

Claims priority, application Japan, Jun. 23, 1988, 63-153468; Jun. 23, 1988, 63-153469

Int. Cl.[5] H04N *1/387, 13/02*

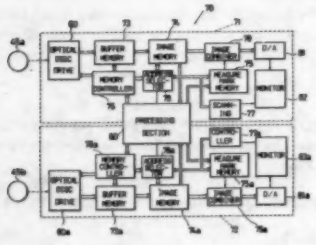
U.S. Cl. 358—88 **13 Claims**

1. A stereoscopic image display apparatus for displaying left and right images on respective left and right monitors located at different positions to provide a stereoscopic vision, comprising:

memory means for storing information regarding the left image represented in a coordinate system and information

regarding the right image represented in a coordinate system;

image transforming means for transforming the coordinate system of the left image to provide first transformed information regarding the left image represented in the transformed coordinate system and the coordinate system of



the right image to provide second transformed information regarding the left image represented in the transformed coordinate system; and

display means for displaying the first transformed information regarding the left image on the left monitor and the second transformed information regarding the right image on the right monitor.

4,962,423

MARK DETECTING METHOD AND APPARATUS

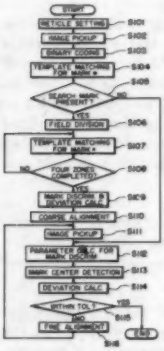
Yuichi Yamada, Kawasaki; Naoki Ayata, Machida; Hiroki Suzukawa, Yokohama, and Hideki Nogawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1989, Ser. No. 301,367

Claims priority, application Japan, Jan. 27, 1988, 63-014526

Int. Cl.[5] H04H *7/18*

U.S. Cl. 358—101 **15 Claims**



1. A mark detecting method for alignment of an object with respect to a predetermined position, said method comprising the steps of:

providing, on the object, an alignment mark usable for the alignment of the object with respect to said predetermined position and an index mark indicative of the position of the alignment mark on the object;

placing the object on a stage;

forming an image of a portion of the object by use of image pickup means and an associated optical system, and discriminating, by use of an image signal from the image pickup means, whether the index mark is present within an image pickup region of the image pickup means;

detecting the position of the alignment mark as indicated by the index mark, by use of calculating means and the image signal from the image pickup means, when the presence of the index mark within the image pickup region is discriminated;

moving the stage by use of stage driving means, on the basis of information indicative of the position of the alignment mark as detected by the calculating means; and

forming an image of the alignment mark, positioned in a desired portion of the image pickup region as a result of the movement of the stage, by use of the image pickup means and the optical system, for aligning the object with respect to said predetermined position.

4,962,424

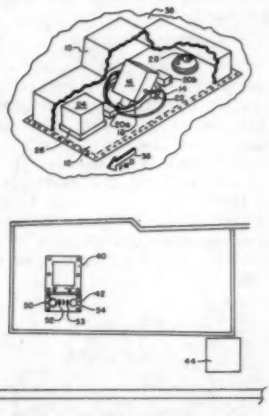
VIDEO AIRDROP SIGHT APPARATUS

Richard O. Durrenberg, Vacaville, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 10, 1989, Ser. No. 322,317

Int. Cl.[5] H04N *7/18*

U.S. Cl. 358—103 **3 Claims**



1. A video airdrop sight apparatus for cargo aircraft comprising in combination:

means for visually determining airdrop release points for airdrop cargo, said visual determining means being mounted on a stabilized structure, said stabilized structure operatively connected to said aircraft, said stabilized structure providing position corrections about the pitch and roll axis, and said visual determining means providing a release point signal, said visual determining means comprises in combination:

means for mounting, said mounting means including a window therein,

a gimbal frame operatively connected to said mounting means and positioned over said window,

a video camera operatively connected to said gimbal frame and centered over said window, said video camera generating video signals,

a roll motor/gimbal point operatively connected to said gimbal frame, said roll motor/gimbal point including a roll synchro,

a roll gimbal point operatively connected to said gimbal frame and positioned diametrically opposite said roll motor/gimbal point,

a pitch driver motor operatively connected to said gimbal frame and to said video camera to control the pitch angle

of said video camera, said pitch driver motor including a pitch synchro,

an amplifier unit operatively connected to said roll motor/-gimbal point and to said pitch drive motor to adjust the pitch and roll attitude of said video camera, and

a gyro stabilizer unit operatively connected to said roll synchro and said pitch synchro to provide stabilization signals thereto, and

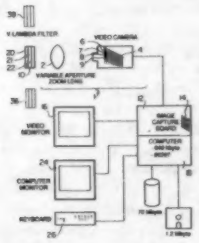
means for monitoring signals, said signal monitoring means operatively connected to said visual determining means, said signal monitoring means receiving and displaying said release point signal, said signal monitoring means having fixed calibrated markings on its screen whereby when said release point signal and said calibrated markings are coincident said airdrop cargo is ejected from said aircraft.

4,962,425

PHOTOMETRIC DEVICE

Mark S. Rea, Orleans, Canada, assignor to National Research Council of Canada/Conseil National deResherches Canada, Ottawa, Canada

Filed Oct. 27, 1988, Ser. No. 263,023
Int. Cl.[5] H04N *17/00*
U.S. Cl. 358—139 **5 Claims**



1. A photometric device, comprising;

(a) a video camera having a pixel sensor array and known pixel value output signals, relative to a black reference zero light value storage element in the sense, array, in response to the spatial—light intensity information being viewed by the camera, the camera having a low geometric distortion,

(b) filter means on the variable aperture lens for, in operation, transforming the camera spectral sensitivity to match a known spectral sensitivity,

(c) an image acquisition board connected to the output from the camera and having a spatial resolution closely related to that of the camera, the board having a dc restoration circuit for correcting any drift in the camera output signal, a pixel value programmable gain and offset amplifier, and means for storing the pixel values in digital form in a frame memory spatial array.

(d) a video target viewer connected to the camera, and

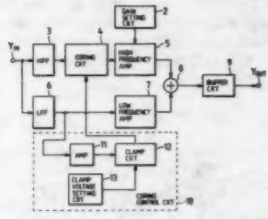
(e) means connected to the output of the image acquisition board for computing visual angle and scaling the pixel output signals for computing contrast from the absolute value in relation to a predetermined light intensity received by the camera, and providing a substantially constant and linear relationship capability between the light input and pixel value output signals over substantially the entire pixel sense array and the light range of operation.

4,962,426

DYNAMIC NOISE REDUCTION CIRCUIT FOR IMAGE LUMINANCE SIGNAL

Nobuaki Naoi, Yokohama; Katunobu Takeda, Kanagawa, and Ikuo Yuki, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 7, 1989, Ser. No. 334,330
Claims priority, application Japan, Apr. 7, 1988, 63-84186
Int. Cl.[5] H04N *5/21, 5/14*
U.S. Cl. 358—167 **9 Claims**



1. A noise reduction circuit comprising:

(1) a signal input terminal through which a luminance signal is received;

(2) noise reducing means for variably reducing a noise signal component included in a luminance signal applied to the signal input terminal according to a noise reduction control signal, by sampling a low amplitude component from said luminance signal, inverting the low amplitude component, controlling the degree of sampling of the inverted low amplitude component according to the noise reduction control signal and adding the controlled inverted low amplitude component to said luminance signal; and

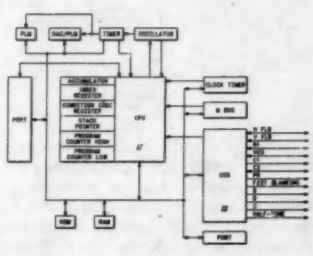
(3) a noise reduction control signal generating circuit which detects the level of a luminance signal applied to the image signal input terminal, produces a noise reduction control signal for reducing the noise reducing effect to the noise reducing means when the level of the luminance signal is high, and produces a noise reduction control signal for enhancing the noise reducing effect to the noise reducing means when the level of the luminance signal is low.

4,962,427

TV RECEIVER INCLUDING MULTISTANDARD OSD

Gerald K. Lunn, Harbour, and Hing Y. Tong, Tsuen Wan, both of Hong Kong, assignors to Motorola Inc., Schuamburg, Ill.

Filed Apr. 20, 1989, Ser. No. 340,639
Int. Cl.[5] H04N *5/44, 5/272, 7/01, 9/74*
U.S. Cl. 358—188 **13 Claims**



2. A television receiver comprising:

a microprocessor including a CPU: and

multistandard on screen display circuitry coupled to said

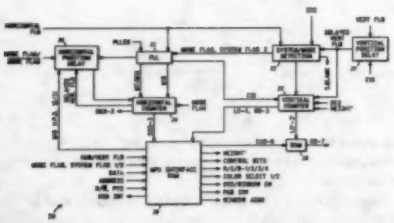
CPU and including a phase locked loop having a plurality of selectable output signals providing a plurality of references utilized in said multistandard on screen display circuitry for operation at the various standards.

4,962,428

MULTISTANDARD OSD IN A TV RECEIVER INCLUDING DISPLAY POSITIONING

Hing Y. Toog, Tsuen Wan, and Gerald K. Lunn, Kowloon, both of Hong Kong, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 20, 1989, Ser. No. 340,640
Int. Cl.[5] H04N *5/44, 5/272, 7/01, 9/74*
U.S. Cl. 358—188 9 Claims



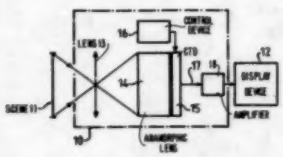
1. A television receiver comprising:
a microprocessor including a CPU; and
multistandard on screen display circuitry coupled to said CPU including horizontal position circuitry adjustable to start horizontal lines at any of a variety of different predetermined positions.

4,962,429

TELEVISION CAMERA HAVING AN INCREASED RESOLUTION IN A PORTION OF THE FIELD OF VIEW

Michel G. Lemonier, Vanves, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 13, 1989, Ser. No. 297,823
Claims priority, application France, Jan. 19, 1988, 88 00552
Int. Cl.[5] H04N *3/14*
U.S. Cl. 358—213.13 12 Claims



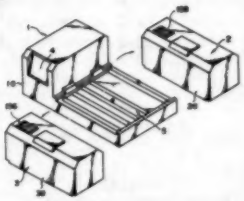
1. A television camera for picking up a scene and for producing a signal for displaying an image therefrom, a portion of which has an increased resolution, characterized in that the camera is provided at its input with a lens which produces an image of the scene on an input face of an anamorphic lens which distorts the image in accordance with a predetermined law in a given direction, the lens cooperating with a charge-transfer pick-up device comprising means for electronically compensating for the distortion produced by the anamorphic lens.

4,962,430

IMAGE READING BODY AND IMAGE FORMATION BODY DETACHABLY MOUNTED TO A CONTROL BODY

Masashi Hiroki; Junichi Koseki, both of Tokyo, and Tuyoshi Todome, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 19, 1989, Ser. No. 423,879
Claims priority, application Japan, Oct. 31, 1988, 63-275643
Int. Cl.[5] H04N *1/028, 1/21, 1/23*
U.S. Cl. 358—296 13 Claims



1. An image forming apparatus comprising:
a control main body including first conveying means for conveying an original and an image forming medium;
a reading main body detachable to said control main body, said reading main body including second conveying means for conveying the original in cooperation with said first conveying means when said reading main body is mounted on said control main body, reading means for reading an image of the original conveyed by said second conveying means to output data corresponding to the image and first memory means for storing the image data read by said reading means;
an image formation main body detachable to said control main body, said image formation main body including third conveying means for conveying the image forming medium in cooperation with said first conveying means when said image formation main body is mounted on said control main body, second memory means for storing image data, and image forming means for scanning the image forming medium to form an image in accordance with the image data stored in said second memory means, on the image forming medium conveyed by said conveying means; and
means for transmitting the image data stored in said first memory means to said second memory means when said reading main body and image formation main body are mounted on said control main body.

4,962,431

SYNCHRONIZING SIGNAL GENERATING SYSTEM FOR LASER SCANNER

Susumu Imakawa, Yokohama; Yoshinobu Takeyama, Kawasaki; Nobuaki Kubo, Urawa, and Masanori Saitoh, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 190,069, May 4, 1988, Pat. No. 4,837,588. This application Feb. 17, 1989, Ser. No. 311,778
Claims priority, application Japan, May 8, 1987, 62-112035; May 8, 1987, 62-112034; Oct. 9, 1987, 62-155325; Oct. 13, 1987, 62-257949; Dec. 4, 1987, 62-307117; Dec. 4, 1987, 62-307118; Apr. 5, 1988, 63-83871; May 6, 1988, 63-109952; May 6, 1988, 63-109948
Int. Cl.[5] H04N *1/04, 1/23;* G01D *15/14*
U.S. Cl. 358—296 6 Claims

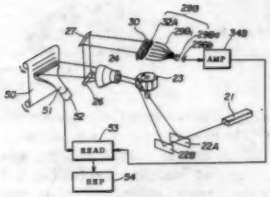
1. A synchronizing signal generating system for a laser scanner, said synchronizing signal generating system comprising:
first means for emitting a first laser beam for recording

information on a medium and for emitting a second laser beam for synchronization of a scan by said first laser beam;

second means for scanning said medium by said first laser beam;

third means for scanning a grating by said second laser beam, said grating having bright portions and dark portions alternately arranged along a scanning direction of said second laser beam;

a converging optical system including a plurality of light converging elements aligned so as to cover a width of scan by said second laser beam measured on said grating,



wherein the first width of scan, by said second laser beam is larger than the width of scan, by said first laser beam, when measured on the same plane, said plurality of light converging elements converging said second laser beam transmitted through said grating;

a light receiving system for receiving said second laser beam converged by said converting optical system and for generating a synchronizing signal; and

fourth means for controlling said first means responsive to said synchronizing signal so as to synchronize a scan timing of said first laser beam.

4,962,432

SELECTIVE RETRIEVAL OF DATA FROM MICROFILM IMAGES OF DIFFERENT FORMS BY READING A MEMORY INDEX FORM CORD (BAR CODE) RECORDED ON EACH IMAGE FRAME

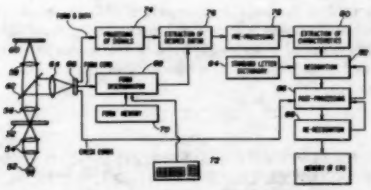
Shuichi Ohtsuka, and Keiichi Yamana, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 28, 1989, Ser. No. 344,731

Claims priority, application Japan, Apr. 30, 1988, 63-107935; Apr. 30, 1988, 63-107937; Aug. 15, 1988, 63-201914; Aug. 15, 1988, 63-201915; Aug. 15, 1988, 63-201916

Int. Cl.[5] H04N *1/23*; G01D *15/14*; G03B *23/12*

U.S. Cl. 358—302 **22 Claims**



1. A system for recording and reading an image information wherein an image containing a certain form and data is recorded on each frame of a microfilm and a desired datum is selected and read from the microfilm, comprising:

a printer for printing a form cord for discriminating said certain form recorded on each frame of said microfilm; and

a reader for reading said form cord and reading-out the corresponding form from a form memory to determine the position of said desired datum so that said desired datum is extracted from the printed image.

4,962,433

VIDEO PRINTER HAVING CONVERTING MEANS FOR CONVERTING A VIDEO SIGNAL INTO DIGITAL PICTURE DATA

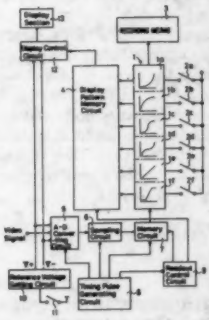
Akira Matsushima, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Jun. 6, 1988, Ser. No. 203,224

Claims priority, application Japan, Jun. 11, 1987, 62-145608

Int. Cl.[5] H04N *5/76, 5/20*

U.S. Cl. 358—335 **4 Claims**



1. A video printer having converting means for converting a video signal into digital picture data comprising:

reference voltage setting means for variably setting a lower limit and an upper limit of a reference voltage used for converting a video signal into digital picture data;

converting means for converting the video signal into the digital picture data, within a range between the lower limit and the upper limit of the reference voltage;

memory means for storing a plurality of converting tables, each corresponding to a different gradation characteristic;

selecting means for selecting one of said converting tables; and

recording means for converting said digital picture data into recording data having different areas with different brightnesses depending upon the selected converting table and for recording a video image according to said recording data.

4,962,434

REPRODUCING DEVICE FOR VIDEO SIGNAL

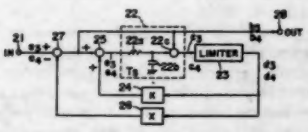
Yasutoshi Matsuo, Kawasaki, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 75,331, Jul. 20, 1987, abandoned. This application Nov. 1, 1989, Ser. No. 430,109

Claims priority, application Japan, Jul. 21, 1986, 61-171392; Jul. 21, 1986, 61-171393

Int. Cl.[5] H04N *5/91*

U.S. Cl. 358—340 **19 Claims**



1. A recording and reproducing device for a video signal

comprising a recording circuit for changing an input video signal to generate a recording video signal, and a reproducing circuit for changing a reproduced video signal to generate an output video signal, said reproducing circuit comprising:

a first high-pass filter having a time constant Ts;

a first limiter for limiting an amplitude of an output signal of said first high-pass filter;

a first coefficient multiplier circuit for multiplying an output signal of said first limiter by a first coefficient K;

a first computation circuit for summing an output signal of said first coefficient multiplier circuit and said output video signal to deliver a signal indicative of the summed result to said first high-pass filter;

a second coefficient multiplier circuit for multiplying an output signal of said first limiter by a second coefficient; and

a second computation circuit for subtracting an output signal of said second coefficient multiplier circuit from said reproduced video signal to output said output video signal, wherein when a time constant corresponding to a frequency at which the noise reduction effect becomes effective is assumed equal to T, said time constant Ts is set within a range $T>Ts>T/(X+1)$, where X is a degree of emphasis of the video signal referred in ratio to a non-emphasized level thereof.

4,962,435

DATA RECORDING/REPRODUCING APPARATUS AND METHOD FOR ACCURATELY PLAYING PROGRAM DATA AFTER DETECTING PROGRAM TOP SIGNAL

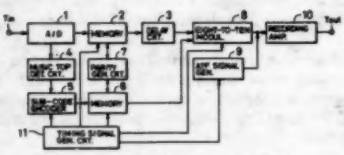
Yoshiki Furuta, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 193,461, May 13, 1988, abandoned. This application Dec. 6, 1989, Ser. No. 445,167

Claims priority, application Japan, May 13, 1987, 62-70107[U]; May 13, 1987, 62-70108[U]

Int. Cl.[5] G11B *15/20*

U.S. Cl. 360—72.2 **4 Claims**



1. A rotary head type digital audio tape recording and reproducing apparatus for a magnetic medium on which a plurality of pieces of input program data and program top detecting signals indicating, as sub-code data, the tops of said input program data are recorded, said apparatus including a data recording system comprising:

a top detecting circuit for detecting the start points of said input program data;

a sub-code encoder for generating said program top detecting signals according to outputs of said top detecting circuit; and

a delay circuit for delaying said input program data for a non-zero predetermined period of time so that each of said program top detecting signals is recorded earlier than respective program data, whereby in a data selection and reproduction operation in which said program data is reproduced from a rise of said program top detecting signal, reproduction is accurately achieved from the respective program top.

4,962,436

RECORDING AND/OR REPRODUCING APPARATUS FOR A RECORD CARRIER IN THE FORM OF A TAPE

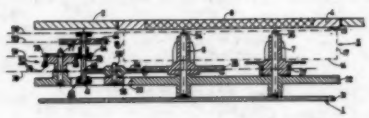
Ernst Bayer, Vienna, and Karl Fischer, Perchtoldsdorf, both of Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 15, 1989, Ser. No. 324,354

Claims priority, application Austria, Jun. 14, 1988, 1544/88

Int. Cl.[5] G11B *15/00, 17/00*

U.S. Cl. 360—96.3 **29 Claims**



1. A recording and/or reproducing apparatus (1) for a record carrier (19) in the form of a tape accommodated in a cassette (5) which can be loaded into the apparatus (1) and which comprises two juxtaposed rotatable reel hubs (20, 21) for taking up the record carrier (19), the apparatus comprising a rotatable forward winding mandril (6) and a rotatable reverse winding mandril (7), which winding mandrils each engage one of the two reel hubs (20, 21) respectively to drive the record carrier (19) when a cassette (5) is present in the apparatus (1) and are each rotationally interlocked with one of two winding mandril wheels (36, 37) which are coaxial with the two winding mandrils (6, 7) and which are both arranged at substantially the same axial level (38) adjacent a cassette main side (14) which faces the winding mandril wheels (36, 37) and comprising a drive arrangement (39) which is constructed to drive the two winding mandril wheels (36, 37) and which comprises a drive shaft (41) which extends parallel to the axes (34, 35) of the winding mandrils (6, 7) and which is rotatably journalled on a bearing support (40) which is movable transversely of the axes (34, 35) of the winding mandrils (6, 7), which drive shaft carries a drive wheel (44) which is rotatable by a motor (43), and which comprises a first shaft section (48) and a second shaft section (49), the first shaft portion (48) being disposed at substantially the same level (38) as the winding mandril wheels (36, 37) and the second shaft section (49) being disposed at a level (51) between the level (38) of the winding mandril wheels (36, 37) and the level (50) of the cassette main-side (13) which is remote from the winding mandril wheels (36, 37), and by means of which the second shaft section one of the two winding mandril wheels (36, 37) is selectively drivable by moving the bearing support (40), a drive transmission (52) being arranged between the second shaft section (49) and the winding mandril wheel (37) which can be driven by means of said shaft section, to bridge the difference between their levels (51, 38), characterized in that the drive wheel (44) on the drive shaft (41) is also disposed at a level (53) between the level (38) of the winding mandril wheels (36, 37) and the level (50) of the cassette main side (13) which is remote from the winding mandril wheels (36, 37).

4,962,437

THIN FILM SERVO HEAD EMPLOYING THE INACTIVE TRANSDUCER COILS TO CANCEL WRITE NOISE FROM NEARBY DATA HEADS

Lawrence A. Wilcox, Yukon, Okla., assignor to Magnetic Peripherals Inc., Minnetonka, Minn.

Continuation of Ser. No. 159,878, Feb. 24, 1988, abandoned. This application Jan. 19, 1990, Ser. No. 471,018

Int. Cl.[5] G11B *5/60, 5/17*

U.S. Cl. 360—103 **2 Claims**

1. A disk drive servo flyer with noise reduction means comprising:

a flyer having a pair of spaced skis extending along the length of the flyer;

each of the skis having an air bearing surface for flying closely adjacent the surface of a magnetic servo disk;

a pair of thin film transducers mounted on one end of the flyer, one transducer attached to each ski;

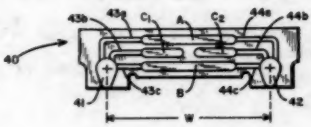
each of said thin film transducers having a coil;

each of coils wound in a direction from the other such that electrical noise generated from nearby data read/write heads during writing on a respective magnetic data disk; induces substantially equal and opposite signals in said coils;

a pair of leads connected to each coil at respective coil ends;

a pair of pads for interconnection to circuitry external to said flyer;

each of said leads of each coil connected to a respective pad such that the respective leads of each coil are interconnected through the respective pads, thereby forming a continuous circuit having at one ski a coil wound in one direction and at the other ski a coil wound in the opposite direction such that the amount of current induced by ambient noise in one of the thin film transducers is cancelled by a substantially equal opposite current induced in the other of said thin film transducers;



each of said thin film transducers further having a magnetic flux conducting core with a pair of pole tips extending toward the air bearing surface of said respective skis;

the pole tips of one of said thin film transducers spaced sufficiently far from its ski air bearing surface so as to not be able to detect magnetic flux from said servo disk adjacent the respective ski at a signal level substantially greater than the ambient noise level, thereby disabling and rendering inactive said one transducer for reading data from said servo disk; and

the pole tips of the other of said pair of thin film transducers extending to said ski air bearing surface so as to be able to detect magnetic flux from said servo disk adjacent the respective ski at a signal level substantially greater than and including the ambient noise level, thereby enabling and rendering active the other of said pair of transducers for reading data from said servor disk;

whereby the servo flyer may be centrally located in a disk platter assembly close to a data read/write head, remain substantially unaffected by the noise created by said data read/write head when it writes onto said magnetic data disk and still read servo data from only one track on a servo data surface by means of said active thin film transducer.

4,962,438

MAGNETIC HEAD MOUNTING PLATE WITH TAPE MOVEMENT LIMITING SURFACE

Norbert Kunze, Ehringshausen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

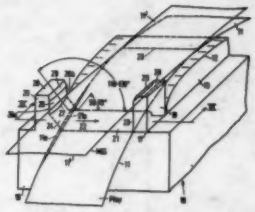
Filed Apr. 11, 1989, Ser. No. 336,193

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1988, 3812362

Int. Cl.[5] G11B *15/60, 5/105*

U.S. Cl. 360—130.21 **4 Claims**

1. A magentic-tape-cassette apparatus (1) comprising a head-mounting plate (10) and a magnetic head (13) arranged on the head-mounting-plate (10) and having a cylindrical tape-contact face (12) and air gap, the magnetic head (13) forming part of a head unit comprising a head support (16) which, viewed in the direction of tape transport, comprises first and second tape guides (18) situated, respectively, before and after the magnetic head (13), each tape guide having a cylindrical curved guide surface (21) bounded at a first side thereof by an alignment surface (23) and at a second side thereof by a control edge (24), an imaginary surface connecting the alignment surfaces (23) extending perpendicularly to a plane through the air gap, each control edge (24) being inclined relative to the corresponding guide surface (21) to thereby urge a magnetic tape (11) toward the corresponding alignment surface (23) during tape transport, and the widths of the guide surface (21) being smaller than or equal to a tape width (b), characterized in that each



control edge (24) of the head support (16) changes to a movement-limiting surface (26), a distance between each alignment surface (23) and its corresponding movement-limiting surface (26), starting from a transition (27), being greater than the tape with (b) in such a way that as the magnetic tape (11) is lifted off the guide surfaces (21) while the magnetic tape is still in contact with the tape-contact face (12) of the head (13) the position of the magnetic tape (11') in the direction of its width is limited with play, said distance increasing from the center of the movement-limiting surface (26) towards its lateral edge (26*a*, 26*b*).

4,962,439

SQUARING CIRCUIT

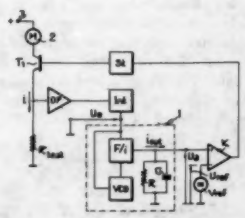
Karl-Diether Nutz, Oedheim, Fed. Rep. of Germany, assignor to Telefunken electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Jan. 25, 1989, Ser. No. 301,975

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1988, 3813413

Int. Cl.[5] H04H *3/08*

U.S. Cl. 361—95 **12 Claims**



5. A squaring circuit for use in an i^2t protective circuit for protection of an electrical load from overload, said squaring circuit having a voltage input and supplying an output voltage whose value is proportional to the square of the value of a voltage at said input, comprising:

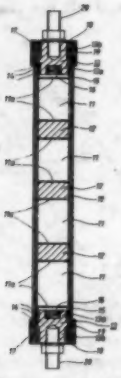
a voltage-controlled oscillator and a frequency/current converter connected to said voltage controlled oscillator, with the input voltage being supplied to said voltage-controlled oscillator and said frequency/current converter and with the output voltage being tappable at an impedance circuit connected to the output of said frequency/-current converter.

4,962,440

SURGE ARRESTER

Bengt Johnnerfelt, and Bengt Thors, both of Ludvika, Sweden, assignors to Asea Brown Boveri AB, Sweden

Filed Sep. 30, 1988, Ser. No. 252,050
Claims priority, application Sweden, Oct. 26, 1987, 8704160
Int. Cl.[5] H02H 9/04
U.S. Cl. 361—126 6 Claims



1. A surge arrester which is resistant to deformation when current flows therethrough, said surge arrester comprising

a generally tubular protective housing which is made of cross-linked high density polyethylene and which has a wall thickness of at least 2 mm,

two spaced apart end electrodes located within said protective housing,

a plurality of cylindrical arrester elements positioned within said protective housing and between said end electrodes, each arrester element being made of a metal oxide varistor material and each defining a central axis, an internal side surface and opposite end surfaces which are perpendicular to said central axis, each end surface including an electrode, and

a plurality of metallic heat-absorbing bodies positioned within said protective housing, each metallic heat-absorbing body being positioned between and in electrical contact with electrodes on end surfaces of two adjacent arrester elements which face one another, said heat-absorbing bodies extending between said end electrodes a length at least 10% of a total length that said arrester elements extend between said end electrodes, said wall of said protective housing being in intimate contact with said external side surfaces of said arrester elements as a result of being shrunk thereon.

4,962,441

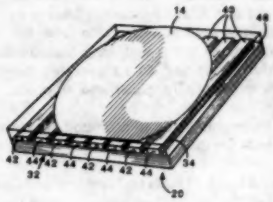
ISOLATED ELECTROSTATIC WAFER BLADE CLAMP

Kenneth S. Collins, San Jose, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Filed Apr. 10, 1989, Ser. No. 335,556
Int. Cl.[5] H02N 13/00
U.S. Cl. 361—234 8 Claims

1. A method to maximize the electrostatic clamping force of a semiconductor wafer to a wafer transfer blade by optimizing the force per unit of input voltage for an selected applied voltage, comprising the steps of:

disposing a layer of dielectric material over at least one pair of interleaved electrodes of selected width on the top surface of a wafer transfer blade, said dielectric having a thickness ranging from approximately 2 mils to 15 mils and the ratio of the selected width of said electrodes and the distance between said electrodes being within the range 3/1 to 2/1; and



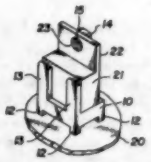
applying a voltage across the electrodes sufficient to flatten the semiconductor wafer against the blade.

4,962,442

FREE-STANDING STANCHION FOR SUPPORTING AND PROTECTING ELECTRONIC DEVICE PACKAGES ON CIRCUIT BOARDS

Donald L. Clemens, The Colony, Tex., assignor to Thermalloy Incorporated, Dallas, Tex.

Filed Mar. 30, 1990, Ser. No. 501,784
Int. Cl.[5] H05K 1/18, 7/12
U.S. Cl. 361—403 9 Claims



6. A free-standing stanchion for supporting an elongated electronic device package having leads extending from one end thereof in an upright position on the surface of a printed circuit board having connection means for electrical interconnection with the leads extending from the device package, said stanchion comprising:

(a) a base portion having first and second oppositely disposed major faces and a plurality of apertures passing therethrough adapted to receive the leads extending from a device package and align said leads with said connection means; and

(b) attachment means extending from said second major face adapted to directly engage said electronic device package and to secure the electronic device package to the stanchion with said leads extending through said holes.

4,962,443

IMPROVED RESIDENTIAL LOADCENTER

Anthony R. Cole, Swindon, United Kingdom, assignor to Square D Company, Palatine, Ill.

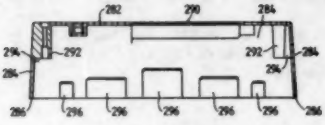
Filed Jan. 17, 1989, Ser. No. 297,906
Claims priority, application United Kingdom, Jan. 14, 1988, 8800850
Int. Cl.[5] H02B 1/40
U.S. Cl. 361—356 6 Claims

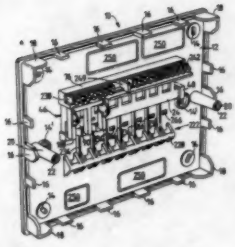
1. A loadcenter comprising:

a generally planar insulating base having means for mounting electrical switchgear thereon, said base being substantially rectangular and including a plurality of uprights about its periphery spaced to permit passage of wires;

means in said base for securing said base to a wall member; and

a protective insulated cover for said base comprising a box including sides engageable with said base and defining a plurality of knockout areas spaced along said sides, said





knockout areas extending to the edges of said sides whereby said protective cover may be removed and installed on said base without disturbing said wires.

4,962,444

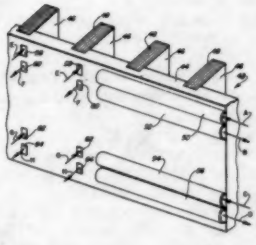
COLD CHASSIS FOR COOLING ELECTRONIC CIRCUIT COMPONENTS ON AN ELECTRONIC BOARD

Richard E. Niggemann, Rockford, Ill., assignor to Sunstrand Corporation, Rockford, Ill.

Filed Jan. 3, 1989, Ser. No. 293,129

Int. Cl.[5] H05K *7/20*

U.S. Cl. 361—382 **29 Claims**



1. A cold chassis for an electronic board in a modular electronic system, comprising a frame having a plurality of projecting ribs defining at least one groove for receiving an edge of the electronic board with the board in engagement with at least one of the ribs, at least the one rib including a plurality of spaced impingement orifice plates defining a tortuous flow path through the one rib, and inlet and outlet means from the frame to the flow path for a cooling fluid to flow through the impingement orifice plates and exchange heat from the electronic board.

4,962,445

HOUSING FOR SUBMERSIBLE EQUIPMENT

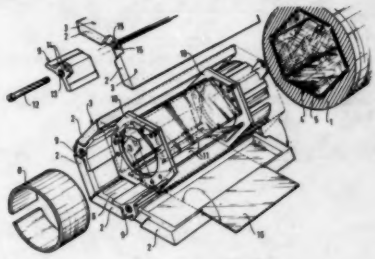
André Pelet, Maurepas, and Jacques Cachot, Saint Michel sur Orge, both of France, assignors to Societe anonyme dite: Alcatel Cit, Paris, France

Filed Apr. 21, 1989, Ser. No. 341,602

Claims priority, application France, Apr. 21, 1988, 88 05297

Int. Cl.[5] H05K *7/20*

U.S. Cl. 361—386 **14 Claims**



1. A housing for submersible equipment including electrical circuits, the housing comprising a heat conducting rigid tubular vessel closed in watertight manner at its ends, and receptacles for receiving the electrical circuits, said receptacles being rigid and heat-conducting and being resiliently pressed forward toward the inside wall of the tubular vessel in such a manner as to allow the heat produced by the circuits to be dissipated out from the housing, wherein the housing includes annular springs of the split annular type each being under compression and individually surrounded by all the receptacles whereby, under expansion of the annular springs, the receptacles are thereby commonly urged by said annular springs in the direction of the inside wall of the tubular vessel.

4,962,446

ELECTRODE TERMINAL FOR CAPACITOR

Tadao Asakura, Kawaguchi, and Shizuo Nishikawa, Tokyo, both of Japan, assignors to New Central Corporation, Tokyo, Japan

Filed May 11, 1988, Ser. No. 193,112

Claims priority, application Japan, May 11, 1987, 62-68873; Apr. 6, 1988, 63-45651

Int. Cl.[5] H05K *7/02*

U.S. Cl. 361—400 **18 Claims**

1. An electrode terminal for a capacitor assembly having a capacitor element and a sealing member by which the capacitor element is sealingly received in the capacitor assembly so that the electrode terminal is available for connection to a conductive substrate, comprising:

a terminal body connected to the capacitor element of the capacitor assembly and extending through the sealing member, said terminal body being formed with a ring-like flange at a portion thereof contiguous to the sealing member; and

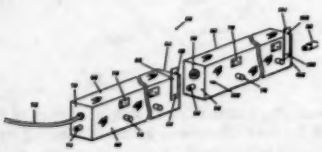
a contact element having an air vent hole securely mounted on an outer bottom end of said terminal body, the contact element connecting the electrode terminal directly to the conductive substrate, said contact element is made of a material exhibiting good soldering characteristics.

4,962,447

RADIO FREQUENCY SIGNAL AND POWER DISTRIBUTION DUCT

Allan Ullman, Lattingtown Rd., Glen Cove, N.Y. 11542

Filed Sep. 5, 1989, Ser. No. 403,194
Int. Cl.[5] H02B *7/00*
U.S. Cl. 361—422 **9 Claims**



1. A modular power and signal distribution system comprising:

an A duct unit;

said A duct unit including means for connecting electric power and a radio frequency signal to a first end thereof;

at least one power receptacle in said A duct unit;

said at least one power receptacle being accessible for supplying said electric power to at least one external device;

at least one coaxial connector;

said at least one coaxial connector being accessible for supplying said radio frequency signal to at least one external device;

a female power connector rigidly affixed to a second end of said A duct unit;

at least a second coaxial connector rigidly affixed to said second end in a predetermined positional relationship with said female power connector;

a second duct unit;

said second duct unit including a male power connector rigidly affixed to a third end thereof;

said second duct unit further including a third coaxial connector rigidly affixed to said third end;

said male power connector and said third coaxial connector being positioned in complementary positional relationship with said female power connector and said at least a second coaxial connector;

said complementary positional relationship being effective, when said third end is brought into mating alignment with said second end, to permit mating engagement between said male power connector and said female power connector and between said at least a second coaxial connector and said third coaxial connector;

first internal means in said A duct unit for connecting said electric power to said at least one power receptacle and said female power connector, whereby connection thereto of electric power from said means for connecting electric power is enabled;

second internal means in said A duct unit for connecting said radio frequency signal from said means for connecting a radio frequency signal to said at least one coaxial connector and said at least a second coaxial connector, whereby connection thereto of said radio frequency signal is enabled; and

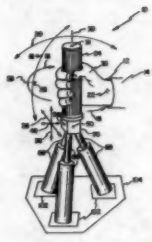
means for retaining said mating engagement.

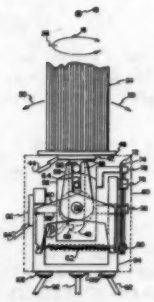
4,962,448

VIRTUAL PIVOT HANDCONTROLLER

Joseph DeMaio, 151 Rosemont Ave., Farmingville, N.Y. 11738; Kathleen M. Radke, 4825 Valley Forge La., Plymouth, Minn. 55442, and James J. Tauer, 6534 Oakley Dr., Fridley, Minn. 55432

Filed Sep. 30, 1988, Ser. No. 251,636
Int. Cl.[5] B64C *13/00*
U.S. Cl. 364—146 **18 Claims**





1. A virtual pivot handcontroller, having six degrees of freedom of motion, comprising:

a spring-loaded universal joint;

a handle connected to said universal joint;

at least one spring-loaded, variable-length leg connected to said universal joint; and

support means, connected to said at least one leg, for supporting said virtual pivot handcontroller; and

wherein:

said handle has first, second and third degrees of rotational motion and first, second and third degrees of translational motion; and

said universal joint comprises:

a base connected to said at least one leg;

a first shaft connected to said base and rotatable about a first axis transverse to said base;

a plate rigidly attached to said first shaft;

a second shaft connected to said plate and rotatable about a second axis orthogonal to said first axis;

a shank rigidly attached to said second shaft and connected to said handle;

first spring means for providing spring tension, connected to said plate and to said base in a fashion such that the rotational position of said first shaft is maintained under tension at a neutral position relative to said base and said first shaft requires an external force to be rotated from the neutral position; and

second spring means for providing spring tension, connected to said second shaft and to said shank in a fashion such that the rotational position of said second shaft is maintained under tension at a neutral

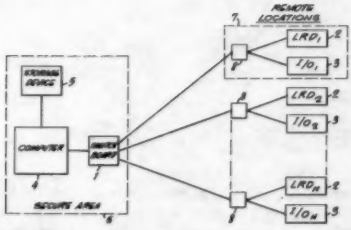
position relative to said first shaft and said second shaft requires an external force to be rotated from the neutral position.

4,962,449

COMPUTER SECURITY SYSTEM HAVING REMOTE LOCATION RECOGNITION AND REMOTE LOCATION LOCK-OUT

Artie Schlesinger, 825 E. 9th St., Brooklyn, N.Y. 11230

Filed Apr. 11, 1988, Ser. No. 180,089
Int. Cl.[5] G06F *15/00, 12/14*
U.S. Cl. 364—200 **7 Claims**



1. A computer security system comprising a switchboard connected to one or more location recognition devices over one or more communications circuits, said switchboard comprising:

means for storing a security map, said security map including one or more authorized location security codes, each of said authorized location security codes representing a location recognition device at an authorized remote location, said security map further including one or more authorized personal identification codes associated with each of said one or more authorized location security codes;

means, connected to said means for storing a security map and said one or more communications circuits, for comparing a location security code, transmitted to said switchboard from a remote location, to said security map for determining whether said location security code is authorized and for denying access to a computer system from said remote location if said location security code is unauthorized;

means, connected to said means for storing a security map and said one or more communications circuits and responsive to said means for comparing a location security code, for setting a lock-out indicator associated with one of said authorized location security codes in response to a specified number of unauthorized user personal identification codes transmitted from a remote location from which said one of said authorized location security codes has been transmitted; and

lock-out means, connected to said means for setting a lock-out indicator, for denying access to said computer system from a remote location from which an authorized location security code has been transmitted if a lock-out indicator associated with said authorized location security code has been set;

each said location recognition device comprising:

means for receiving a location security code from a source external to said location recognition device;

means, connected to said means for receiving a location security code, for storing said location security code; and

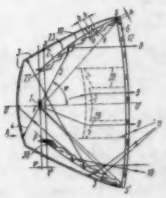
means, connected to said means for storing a location security code and a communications circuit, for transmitting a stored location security code to said switchboard.

4,962,450

LIGHT SIGNALLING DEVICE

Evgeny F. Reshetin, 5 ulitsa Sokolinoi gory, 19, kv. 96., Moscow, U.S.S.R.

PCT No. PCT/SU88/00007, § 371 Date Sep. 16, 1988, § 102(e) Date Sep. 16, 1988, PCT Pub. No. WO88/05584, PCT Pub. Date Jul. 28, 1988
PCT Filed Jan. 7, 1988, Ser. No. 271,955
Claims priority, application U.S.S.R., Jan. 19, 1987, 4183840; Jan. 19, 1987, 4184103
Int. Cl.[5] F21V *13/04*
U.S. Cl. 362—268 **14 Claims**



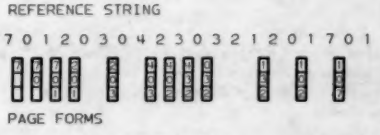
1. A light signalling device comprising a collimator with a reflector (2), a light source (1) disposed at the focal point (F) of the collimator, and an absorber (3) of light rays, characterized in that at least a portion of the surface of the absorber (3) is arranged at an angle to the focal rays of the collimator, the reflector (2) and the absorber (3) being mutually positioned so that any focal ray (4) directed in opposition to a focal ray (5) incident on the reflector (2) falls onto the absorber (3), said reflector (2) being made of a transparent material configurated in the form of a total internal reflection surface, the surface of the absorber (3) encompassing the light source (1) and the reflecting surface on the side opposite to a light aperture (SS') of the device.

4,962,451

CACHE-EFFECTIVE SORT STRING GENERATION METHOD

Douglas R. Case, San Jose, and Watson M. Conner, Atherton, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 7, 1985, Ser. No. 796,034
Int. Cl.[5] G06F *7/24, 7/06*
U.S. Cl. 364—900 **2 Claims**



1. A new use for an LRU-managed cache coupling the main memory of a CPU for sort string generation of m records while minimizing the number of reference misses per record to said cache, said sort string generation being manifest as a nested ordering of keys of the records, said cache having a storage capacity of g keys above which capacity at least one cache resident key would be flushed on the next miss reference to said cache, comprising the steps of:

(a) during a first pass, repeatedly calling one of m/s subsets of ($s < g$) keys of the records resident in main memory into cache, arranging the called subset into a partial nested ordering thereof, and writing the nested ordering to main memory until m/s subsets have been exhausted; and

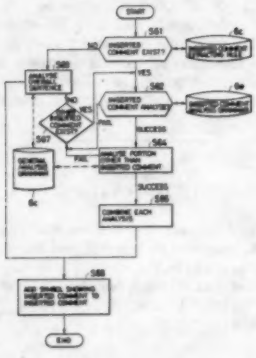
(b) during a second pass, repeatedly executing a (t<s) way replacement selection merge in the cache from among at least one key selected from each of t partial nested orderings of the subsets resident in main memory until the m/s such orderings become exhausted.

4,962,452

LANGUAGE TRANSLATOR WHICH AUTOMATICALLY RECOGNIZES, ANALYZES, TRANSLATES AND REINSERTS COMMENTS IN A SENTENCE

Hiroyasu Nogami; Seiji Miike, both of Yokohama; Kimihito Takeda, Odawara; Shin-ya Amano, Yokohama, and Chiaki Aoyama, Nakano, all of Japan, assignors to Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 45,592, May 4, 1987, abandoned. This application Aug. 23, 1989, Ser. No. 399,437
Claims priority, application Japan, May 8, 1986, 61-103844
Int. Cl.[5] G06F *15/38*
U.S. Cl. 364—419 17 Claims



17. A method for translation between source and target natural languages using a programmable computer system, comprising the steps of:

storing in a memory of the computer system a source text to be translated;

comparing the source text with rules which have been predetermined in the computer system to indicate that the text includes a potential inserted comment;

extracting the potential inserted comment from the text if said comparing step indicates the text may conform to one of the rules;

attempting translation of the potential inserted comment; and

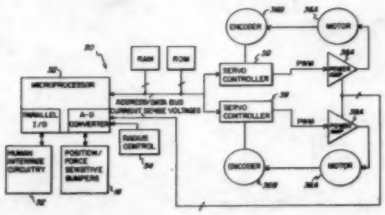
translating the text including the potential inserted comment, when the translation of the potential inserted comment fails, or translating, when the translation of the potential inserted comment succeeds, a remainder of the text excluding the potential inserted comment and inserting the translation of the potential inserted comment into the translation of the remainder of the text.

4,962,453

AUTONOMOUS VEHICLE FOR WORKING ON A SURFACE AND METHOD OF CONTROLLING SAME

William Pong, Brookfield Center; Joseph F. Engelberger, Newtown; John M. Evans, Jr., Brookfield, and William S. Kazman, Danbury, all of Conn., assignors to Transitions Research Corporation, Danbury, Conn.

Filed Feb. 7, 1989, Ser. No. 307,765
Int. Cl.[5] G06F *15/50*
U.S. Cl. 364—424.02 23 Claims



1. A method of controlling the movement of an autonomous vehicle working on a surface, said vehicle having means for moving the vehicle, means for turning the vehicle, means for determining the distance traversed by the vehicle and means for sensing contact of the vehicle with an obstacle, comprising:

a. establishing a starting point for the vehicle to work on the surface;

b. from an origin point, initially at the starting point, causing the vehicle to traverse a distance "R", or until the vehicle encounters an obstacle;

c. causing the vehicle to return to the origin after traversing the distance "R" or encountering an obstacle;

d. upon completion of the return in the step c, at the origin, turning the vehicle through an angle; and

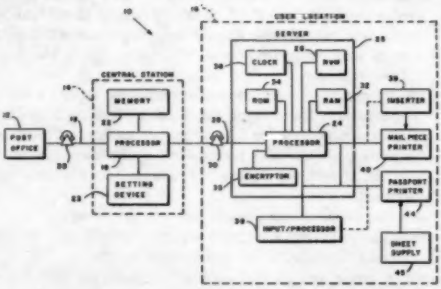
e. in an "iteration", repeating the steps b, c and d until the total of the angles turned in the step d reaches a predetermined limit.

4,962,454

BATCH MAILING METHOD AND APPARATUS: PRINTING UNIQUE NUMBERS ON MAIL PIECES AND STATEMENT SHEET

Ronald P. Sansone, Weston; Michael P. Taylor, Norwalk, and Terrence M. Doeberl, West Redding, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 26, 1985, Ser. No. 813,445
Int. Cl.[5] G06K *21/06*
U.S. Cl. 364—464.02 24 Claims



1. A method of processing mail pieces forming a batch of mail and accounting for postage required for such mail, the method comprising the steps of:

storing a postage value and a unique identification number for said batch of mail;

printing mail data including said unique identification number on each mail piece of a batch of mail pieces with a first printer;

printing said unique identification number and postage data indicating the total amount of postage required to mail said mail pieces of said batch on a statement sheet with a second printer separate from said first printer; and

subtracting said total postage amount from said stored postage value.

4. A system for processing a plurality of mail pieces forming a batch of mail comprising: an accounting unit, said accounting unit including a first processor and a first memory in communication with said first processor; means for printing, said printing means connected in communication with said first processor; means for supplying said plurality of mail pieces of said batch to said printing means; means for supplying a sheet to said printing means; and said first processor controlling said printing means; and said first processor controlling said printing means to print postal information on the respective mail pieces of said batch, said postal information including an identification number for said batch; and said first processor controlling said printing means to print a verifiable statement including said identification number and a total of postage required for mailing said batch on said sheet to permit verification of the total postage for said small pieces of said batch.

20. A system for processing mail pieces forming a batch of mail and accounting for postage required for such mail, said system comprising:

a processor,

memory means connected in communication with said processor for storing a postage value;

first printing means controlled by said processor for printing mail piece data on respective mail pieces of a batch thereof, said mail piece data including a unique identification number;

second printing means controlled by said processor and separated from said first printing means for printing on a statement sheet said unique identification number and postage data indicating the total amount of postage required to mail said batch of mail pieces; and,

said processor including means for subtracting said total postage amount from said stored postage value.

4,962,455

ANTI-SKID BRAKE CONTROL SYSTEM WITH FEATURE OF PROJECTION OF VEHICLE BODY SPEED REPRESENTATIVE DATA WITH HIGH PRECISION

Yasuki Ishikawa, Tokyo; Yoshiki Yasuno, Kanagawa; Akira Higashimata, Kanagawa, and Takeshi Fujishiro, Kanagawa, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Mar. 31, 1989, Ser. No. 331,169

Claims priority, application Japan, Mar. 31, 1988, 63-78566

Int. Cl.[5] B06T *8/32*

U.S. Cl. 364—426.02 **12 Claims**

1. An anti-skid brake control system for an automotive vehicle, comprising:

a braking circuit connecting a pressurized fluid source to a wheel cylinder for each of front and rear wheels for building up braking pressure;

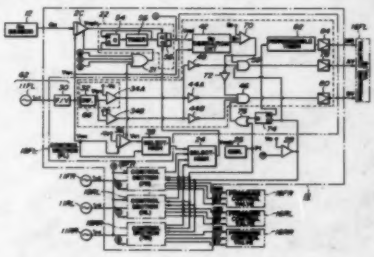
a pressure control valve means, disposed in said braking circuit, for controlling braking pressure in said wheel cylinder, said pressure control valve means operable for increasing braking pressure in said wheel cylinder in a first mode and decreasing braking pressure in said wheel cylinder in a second mode;

first sensor for monitoring rotation speed of associated one of the front and rear wheels for producing a wheel speed indicative signal;

second sensor for monitoring vehicular deceleration magnitude of a vehicle body for producing a deceleration magnitude indicative signal;

third means for latching said wheel speed indicative signal upon initiation of a skid control cycle and deriving a first vehicle body speed representative data on the basis of said latched wheel speed indicative signal value and an integrated value of said deceleration magnitude indicative signal;

fourth means for latching said wheel speed indicative signal upon initiation of a skid control cycle and deriving a



second vehicle body speed representative data on the basis of said latched wheel speed indicative signal and an integrated value of a predetermined fixed deceleration gradient representative value;

fifth means for selectively outputting one of said first and second vehicle body speed representative data; and

sixth means for producing a control signal for operating said pressure control valve means between said first and second mode positions according to a predetermined schedule on the basis of said wheel speed indicative signal and said selected vehicle body speed representative data.

4,962,456

DIAGNOSIS SYSTEM FOR A MOTOR VEHICLE

Kunihiro Abe, and Tomoya Kobayashi, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 278,742

Claims priority, application Japan, Dec. 11, 1987, 62-313433

Int. Cl.[5] G01M *15/00*; F02D *41/26*; F02P *17/00*

U.S. Cl. 364—431.01 **5 Claims**

5. In a system for diagnosing an automotive engine which is mounted on a motor vehicle and controlled by an electronic control system, the diagnosing system having a diagnosis device powered by turning on a power switch, a cartridge detachably connected to the diagnosis device and a communication control section provided with a CPU and a memory, connecting means for transmitting signals between the electronic control system and the diagnosis device, a keyboard provided in said diagnosis device for inputting a keyboard signal, and said communication control section being responsive to said keyboard signal for monitoring operating condition of the engine, the improvement in the communication control section comprising:

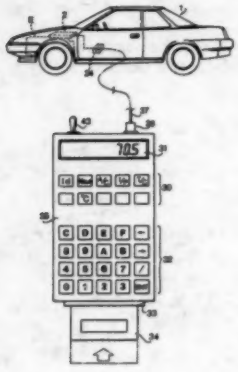
first select means responsive solely to turning on the power switch for selecting one of data formats stored in the memory representing a plurality of transmitting patterns for transmitting data between the electronic control system and the diagnosis device;

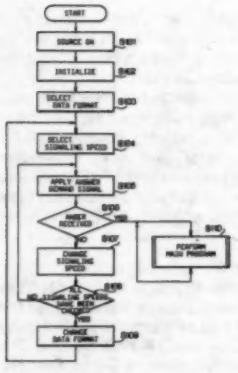
second select means responsive solely to turning on the power switch for selecting one of signaling speeds representing a plurality of transmitting speeds for transmitting data between the electronic control system and the diagnosis device;

demand means for sending an answer demand signal repre-

senting one of said data formats and signaling speeds to the electronic control system; and

wherein said electronic control system has its own data format and signaling speed dependent on its type of electronic control system for the engine, and said electronic





control system is arranged to provide an answer signal when said answer demand signal applied thereto corresponds to said own data format and signaling speed; and

said diagnosing system comprises means responsive to said answer signal for performing a diagnosis dependent on a selected data format and signaling speed.

4,962,457

INTELLIGENT VEHICLE-HIGHWAY SYSTEM

Kan Chen, Ann Arbor, and Robert D. Ervin, Plymouth, both of Mich., assignors to The University of Michigan, Ann Arbor, Mich.

Filed Oct. 25, 1988, Ser. No. 262,360

Int. Cl.[5] G08G 1/00

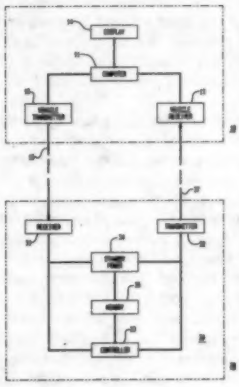
U.S. Cl. 364—443 **12 Claims**

9. A method of providing information pertaining to the characteristics of a predetermined geographical region which may be of interest to an operator of a vehicle being operated on a roadway in the predetermined geographical region, the method comprising the steps of:

storing the information pertaining to the characteristics in a data storage system arranged in the vicinity of the roadway;

transmitting a request signal in the form of electromagnetic energy from a transmitter installed on the vehicle to said data storage system, said request signal having an interrogator component and an enabling component;

receiving at a receiver in the vehicle a data signal containing said information stored in said data storage system, said



information being responsive to said interrogator component of said request signal; and

converting said information in said data signal to a form understandable to the operator of the vehicle.

4,962,458

ROUTE PLANNER DEVICE

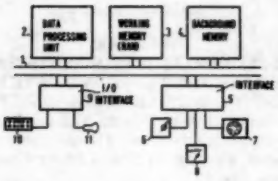
Rik A. Verstraete, Kontich, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 25, 1988, Ser. No. 236,500

Claims priority, application Netherlands, Aug. 28, 1987, 8702014

Int. Cl.[5] G06F 15/50

U.S. Cl. 364—443 **17 Claims**



1. A planner device for planning a route through a topological road network, comprising:

background memory means for storing said network as a set of n-cell tables (n=0.1) of road segments or junctions;

random access working memory means for storing a subset of said set of n-cell tables as actually used in said planning;

address assigning means for assigning a respective first working memory address to each entry of each n-cell table used in planning the route;

data processing means coupled to said working memory means comprising:

expansion means for pointing to a set of candidate n-cells for said route, starting from one end of the route until the other end of the route is reached, on the basis of an actual expansion index indicating an actual n-cell;

linking means for linking each first working memory address pertaining to a candidate n-cell pointed to by

said expansion means, to a second working memory address containing the n-cell used for said pointing;

evaluation means for assigning an evaluation value to each candidate n-cell pointed to by the expansion means;

selection means for selecting a candidate n-cell having the most advantageous evaluation value among those that have not led to an expansion index,

repeat control means for repeatedly activating said expansion means, said evaluation means and said selection means until said other end of the route is reached, and

backtracking means activated by said repeat control means for backtracking a linked set of candidate n-cells starting from the n-cell containing said other end until said one end is reached, said linked set constituting said route.

4,962,459

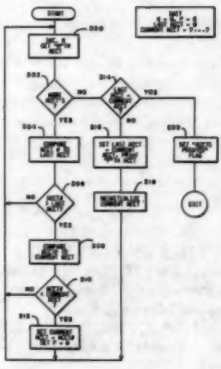
SYSTEM FOR ACCOUNTING FOR POSTAGE EXPENDED BY A POSTAGE METER HAVING DATA SECURITY DURING PRINTING

Joseph D. Mallozzi, 112 Teeter Rock St., Trumbull, Conn. 06611; Neale C. Hutcheson, 205 Park St., New Canaan, Conn. 06840; Michelle S. Breault, 199 Osborne Hill Rd., Fairfield, Conn. 06430, and Edward P. Daniels, 350 Stonehouse Rd., Trumbull, Conn. 06611

Filed Dec. 26, 1985, Ser. No. 813,458

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—464.02 **15 Claims**



12. A postage metering and accounting system comprising:

(a) data entry means for entry by an operator of commands and information, said information including postal information, said postal information including account numbers;

(b) a printer;

(c) a memory for storing program data and account records, said account records each corresponding to one of said account numbers, said memory further comprising a non-volatile memory for storing said account records;

(d) interface means for interfacing to a postage meter, said postage meter being connected to said interface means;

(e) processing means further comprising a CPU connected to said data entry means, said memory, said printer, and said interface, and responsive to said program data for:

(e1) responding to entry of an item of said postal information corresponding to a particular batch of mail to transmit signals through said interface to set said postage meter to print indicia indicative of a selected postage amount, and responding to signals received through said interface specifying postage expended on said particular batch of mail to update one of said account records corresponding to one of said account numbers specified by said item to account for said postage expended;

(e2) responding to entry of a report command to print said account records in account number order on said printer by scanning all said account records, determining the next account record, in account number sequence, which has not been printed, and printing said determined account recorded; and,

(e3) repeating the procedure of (e2) until all said account records are printed.

4,962,460

DIGITIZING APPARATUS FOR DIGITIZING A MODEL SURFACE USING A CONTACTLESS PROBE

Hitoshi Matsuura, Hachioji, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

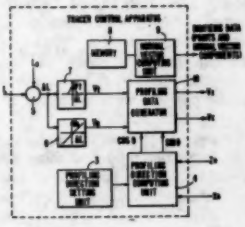
PCT No. PCT/JP88/00762, § 371 Date Feb. 8, 1989, § 102(e) Date Feb. 8, 1989, PCT Pub. No. WO89/00906, PCT Pub. Date Feb. 9, 1989

PCT Filed Jul. 28, 1988, Ser. No. 309,800

Claims priority, application Japan, Jul. 31, 1987, 62-192296

Int. Cl.[5] G06F *15/46*

U.S. Cl. 364—474.03 **4 Claims**



1. A digitizing apparatus in which the surface of a model is traced by a probe which measures distance contactlessly, thereby forming digitizing data along the profiling path, said digitizing apparatus comprising:

profiling direction setting means for setting a first profiling direction for defining the profiling path, and for setting a second profiling direction which perpendicularly intersects the first profiling direction;

memory means, operatively connected to said profiling direction setting means, for storing tangent vectors computed from an error quantity between a probe measurement distance and a reference distance in said first and second profiling directions;

arithmetic means, operatively connected to said memory means, for computing from a perpendicular vector computed on the basis of said tangent vectors, a normal vector with regard to the surface of the model at a point of intersection between said first and second profiling directions; and

correcting means, operatively connected to said arithmetic means, for correcting, on the basis of the normal vector, digitizing data formed in accordance with said first profiling direction.

4,962,461

METHOD FOR THE REPRODUCABLE FORMATION OF MATERIAL LAYERS AND/OR THE TREATMENT OF SEMICONDUCTOR MATERIALS LAYERS

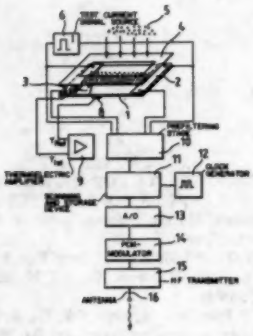
Meinhard Meyer, Munich, and Oswald Störmer, Tuntenhausen, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 170,548, Mar. 21, 1988, abandoned. This application Jan. 2, 1990, Ser. No. 462,358

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1987, 3710365

Int. Cl.[5] G01N *27/02*; C23C *14/54*

U.S. Cl. 364—482 49 Claims



1. In a production process for either the reproducable formation of material layers on substrates by vapor deposition, sputtering, chemical deposition or similar methods or the treatment of material layers on substrates, the method for controlling the process comprising the repeatable steps of

generating a test signal;

applying the test signal to the layers whose growth and characteristic parameters will be used to control the process;

receiving the test signal from the layer;

analyzing the test signal by determining its impedance components, said impedance components comprising intrinsic impedance, grain boundary impedance and surface impedance;

comparing the test signal's impedance components with stored reference impedance component values for the layer being tested; and

controlling the parameters of the process in response to the differences detected between the stored reference impedance component values and the test signal's impedance components.

4,962,462

FUEL CELL/BATTERY HYBRID SYSTEM

Imre Fekete, deceased, Late of Piscatsway, N.J. (by Anna M. Fekete, Administratrix), assignor to Engelhard Corporation, Iselin, N.J.

Continuation of Ser. No. 233,192, Aug. 17, 1988, abandoned, which is a continuation of Ser. No. 51,212, May 13, 1987, abandoned, which is a continuation of Ser. No. 894,473, Aug. 4, 1986, abandoned, which is a continuation of Ser. No. 537,459, Sep. 29, 1983, abandoned. This application Apr. 26, 1989, Ser. No. 344,464

The portion of the term of this patent subsequent to Jun. 5, 2007, has been disclaimed.

Int. Cl.[5] H02J *7/00*; G06F *15/20*

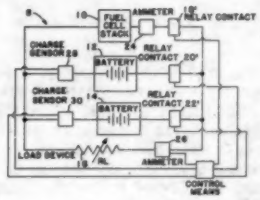
U.S. Cl. 364—492 10 Claims

1. A hybrid power source system for supplying electrical current to a load and for controlling the amount of current supplied in response to current demand from the load, comprising:

a primary electrical energy source couplable to the load through a first switch means associated therewith and having a predetermined maximum desired power output;

first energy storage means couplable to the load in parallel with the primary electrical power source through a second switch means associated therewith;

second energy storage means couplable to the load in parallel with the primary electrical power source through third switch means; either said primary electrical energy source, said first, and said second energy storage means or



combinations thereof being connected to the load in parallel to supply current to the load depending upon whether said first, said second or said third switch means or a combination thereof is approximately energized;

load current sensing means for sensing the current flowing into the load; and

control means responsive to said load current sensing means for selectively energizing either said first, second or third switch means in a manner such that the current demand on said primary electrical energy source is maintained at or below approximately its predetermined maximum desired power output level.

4,962,463

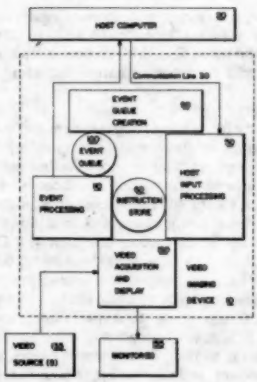
VIDEO IMAGING DEVICE WITH IMAGE ALTERING CONTROLS AND RELATED METHOD

Patricia J. Crossno; Gary H. Mendelsohn, and William F. Hedberg, all of Albuquerque, N. Mex., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jul. 1, 1988, Ser. No. 214,221

Int. Cl.[5] G09G *1/06*

U.S. Cl. 364—518 6 Claims



1. A video imaging device including means for coupling said

video imaging device to (i) a host computer by a communication line over which control data is transmitted, (ii) a source of video information, and (iii) a monitor by a video line over which video signals based upon that video information and control data are transmitted from the video imaging device to the monitor, said control data including information for forming condition blocks and corresponding sets of instruction blocks, each of said condition blocks being settable into an active or an inactive state, and each of said instruction blocks containing at least one instruction to be executed by said video imaging device which either manipulates the video signals or sets the state of at least one said condition block, said video imaging device comprising:

means for converting said ideo information into said video signals for transmittal to said monitor over said video line;

means for receiving said control data transmitted over said communication line and for forming said condition blocks and said sets of instruction blocks from the information in said control data;

means for storing said condition blocks and said corresponding sets of instructions blocks;

means for receiving user-generated event data;

means for setting the states of certain of said stored condition blocks in response to said user-generated event data; and

means for executing the instruction blocks in the sets of instruction blocks corresponding to the condition blocks which are in the active state, thereby causing the manipulation of said video signals

and the setting of the states of certain of said stored condition blocks in accordance with the executed instruction blocks.

4,962,464

SERPENTINE COLUMNAR PLOTTING SYSTEM

Max P. Henzi, Concord, and Marius Matoic, Berkeley, both of Calif., assignors to Lavenir Technology, Inc., Pleasant Hill, Calif.

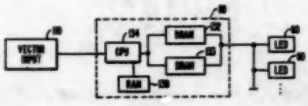
Continuation of Ser. No. 17,668, Feb. 24, 1987, abandoned. This application Apr. 20, 1989, Ser. No. 341,319

Int. Cl.[5] G06F *15/62*

U.S. Cl. 364—518 **15 Claims**

MICROFICHE APPENDIX INCLUDED

(1 Microfiche, 29 Pages)



1. A serpentine columnar plotting method for creating an image of a resolution on a print region of a printing medium, the print region having a length and a width, comprising the following steps:

(a) positioning a row of image markers along a marker direction generally parallel to the width, the image markers extending across substantially the entire width of the print region, the image markers spaced apart in the marker direction at a chosen common interval equal to at least three times the resolution;

(b) moving, from a start location, the row of image markers and the printing medium relative to one another in a columnar direction transverse to the marker direction, the columnar direction being generally parallel to the length;

(c) halting the relative movement of the row of image markers and the printing medium at a stop location;

(d) indexing the row of image markers and the printing medium relative to one another an index distance generally parallel to the marker direction;

(e) moving the row of image markers and the printing medium relative to one another in a return direction, parallel to and opposite the columnar direction, to the start columnar location after the indexing step (d); and

(f) actuating the image markers at chosen columnar positions for imaging image marks on the printing medium during the moving steps (b) and (e);

(g) indexing, in the marker direction after the moving step (e), the row of image markers and the printing medium relative to one another;

(h) repeating steps (b) through (g) a chosen number of times, the actuating step including:

(i) receiving vector input data from a vector input source;

(j) computing a first set of image mark data for each columnar position for each image marker during the movement of the image markers from a first set of start locations to a first set of stop locations;

(k) writing the first set of image mark data into a first memory area;

(l) computing a second set of image mark data from each columnar position for each image marker during subsequent movement of the image markers from a second set of start locations to a second set of stop locations;

(m) writing the second set of image mark data into a second memory area;

(n) actuating the image markers according to the image mark data in the first memory area during the computing step (l) and the wiring step (m); and

(o) actuating the image markers according to the image mark data in the second memory area during the computing step (j) and the writing step (k).

4,962,465

CHARACTER PROCESSOR PROVIDED WITH DOT PATTERN CORRECTING FUNCTION

Keizo Saito, Kyoto, and Masanobu Watanabe, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 28, 1988, Ser. No. 291,230

Claims priority, application Japan, Dec. 28, 1987, 62-335194

Int. Cl.[5] G09G *5/26*; G06F *15/68*

U.S. Cl. 364—518 **18 Claims**

9. A character processing system for producing an enhanced contour outline of an original pattern input into said system, said system comprising:

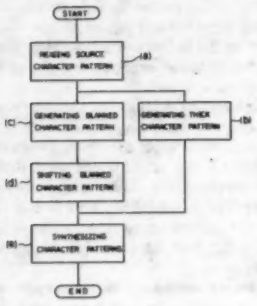
blank character pattern generating means for generating contour image data, in the form of a contour outline, from said input original pattern;

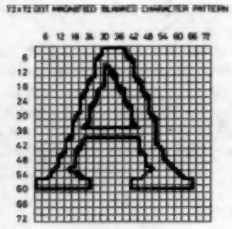
thick character pattern generating means for generating image data from said input original pattern, which has been thickened by a predetermined amount in a plurality of predetermined directions and thereby enhanced;

shifting means, connected to said blank character pattern generating means, for shifting said generated contour image data a predetermined amount in said plurality of predetermined directions, in proportion to said predetermined amount thickened by said thick character pattern generating means; and

synthesizing means, connecting said shifting means and said

thick character pattern generating means, for combining said shifted contour image data with said enhanced image





data to thereby form an enhanced contour outline of said original pattern.

4,962,466

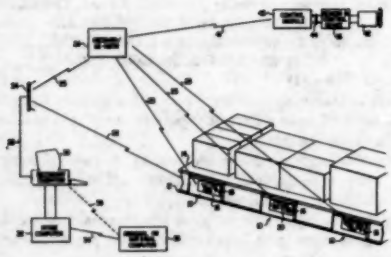
ELECTRONIC PRODUCT INFORMATION DISPLAY SYSTEM

Michael S. Revesz, Carrollton; Harold G. Burkett, Jr., Lewisville, and Robert C. Gilbert, Richardson, all of, assignors to Viscom Systems, Inc., Dallas, Tex.

Continuation of Ser. No. 31,396, Mar. 27, 1987, Pat. No. 4,888,709. This application Dec. 19, 1989, Ser. No. 453,816

Int. Cl.[5] G06F *15/16*

U.S. Cl. 364—518 **8 Claims**



1. A method for displaying product information at locations proximate to associated products, comprising the steps of:

mounting a plurality of electronic display modules at locations proximate to respective different goods;

programming each module with a module address;

forming a signal comprising address and data parts, the address part representing a module address and the data part representing product information for the module address;

broadcasting a non-pulsed signal having a band width selected from the spectral band consisting of infrared and visible light;

receiving said signal by a plurality of receiving modules, the receiving modules comprising at least some of the electronic display modules;

decoding the address part of said signal by each receiving module into a received address;

comparing the received address to the module address for each receiving module;

matching the received address to the module address in at least one addressed module among the receiving modules;

for each addressed module, decoding the data part of the signal into product information;

storing the decoding product information in a memory of the addressed module; and

displaying the stored product information on a display of the addressed module responsive to said step of matching.

4,962,467

GRAPHIC PRINTER

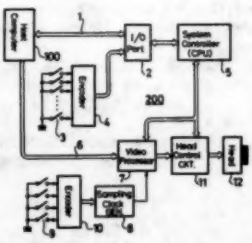
Teruyasu Hanagami, Chiba; Michihiro Hino, Kanagawa; Takeshi Nakajima, Kanagawa, and Shoichi Hori, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 196,729, May 20, 1988, abandoned. This application Mar. 14, 1990, Ser. No. 493,361

Claims priority, application Japan, May 21, 1987, 62-124707; May 22, 1987, 62-125491

Int. Cl.[5] G01D *15/00*

U.S. Cl. 364—519 **2 Claims**



1. A graphic printer system for printing out a video signal from a host computer comprising:

(a) means for sampling the video signal by a predetermined sampling clock pulse and latching a sampled video signal;

(b) means for generating a plurality of sampling clock pulses having phases displaced from the phase of a reference sampling clock; and

(c) selecting means for selecting from among the plurality of sampling clock pulses and supplying the selected sampling clock pulses to the means for sampling as the predetermined sampling clock.

4,962,468

SYSTEM AND METHOD FOR UTILIZING FAST POLYGON FILL ROUTINES IN A GRAPHICS DISPLAY SYSTEM

Gary M. Beauregard; Larry K. Loucks; Khoa D. Nguyen, and Robert J. Urquhart, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 9, 1987, Ser. No. 130,851

Int. Cl.[5] G09G *1/16*

U.S. Cl. 364—521 **28 Claims**

1. A method in a graphics display system for filling a poly-

gon having a boundary of a plurality of line definable by a plurality of selectable pels, said method comprising:

testing the polygon for strict convexity;

traversing sequentially the boundary along each one of said plurality of lines one at a time;

storing, during said sequential traverse for a given line of said traverse, a minimum value of at least one of said plurality of selectable pels for each one of a plurality of scan lines if said minimum value is less than a different value for any different one of said selectable pels of said boundary of said polygon at said scan line;

```
4048    }
4049
4050
4051    shape= atoi(argv[1]);
4052    iter= atoi(argv[2]);
4053
4054    /* below code will be in GSL init one time */
4055    for (i= 0; i<2049; i+= 2) { /* init the y elements */
4056      yv[i] =  -i >> 4;
4057      yv[i+1] = i >> 4;
4058    }
4059
4060    if((shape >=4) && (shape <= 7)) { /* read in the poly */
4061      inlines = atoi(argv[3]);
4062      ymin = 4000;
4063      ymax = 0;
4064
4065      for(i= 0; i< inlines; i++) {
4066    inx[i]= atoi(argv[4 + 2 * i]);
4067    iny[i]= atoi(argv[5 + 2 * i]);
4068    if(iny[i] > ymax) ymax = iny[i];
4069    if(iny[i]< ymin) ymin = iny[i];
4070      }
4071      printf("\n ymin= %d ymax= %d\n", ymin, ymax);
4072      /* my own copy of the points so I'll add 2 points for gaff.c */
                                © COPYRIGHT IBM CORP 1987
```

storing, during said sequential traverse for a given line of said traverse, a maximum value of at least one of said plurality of selectable pels for each one of a plurality of scan lines if said maximum value is greater than a different value for any different one of said selectable pels of said boundary of said polygon at said scan line; and

drawing a fill line, after said sequential traverse, between said selectable pel having said minimum value and said selectable pel having said maximum value for each one of said plurality of scan lines.

4,962,469

EXERCISE MEASURING INSTRUMENT

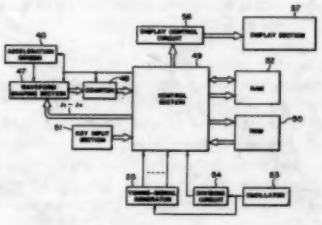
Haruo Ono; Satoshi Kinoshita, and Fusao Suga, all of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1989, Ser. No. 339,179

Claims priority, application Japan, Apr. 18, 1988, 63-51776[U]; Jun. 15, 1988, 63-79116[U]; Oct. 31, 1988, 63-142496[U]

Int. Cl.[5] G01C *22/00*

U.S. Cl. 364—561 **34 Claims**



1. An exercising measuring instrument, comprising:

acceleration sensor means to be worn on a body of an exerciser, for outputting a waveform signal representative of acceleration which is received by said acceleration sensor means in response to movements of said exerciser;

amplifying means coupled to said acceleration sensor means, for amplifying said waveform signal outputted from said acceleration sensor means;

manually operable switching means for selecting one exercise mode out of a plurality of exercise modes, each exercising mode representing a form of an exercise performed by said exerciser;

amplifier-gain control means coupled to said manually operable switching means, for varying the amplifier-gain of said amplifying means in accordance with the exercise mode selected by said manually operable switching means;

exercise-measuring means for measuring exercise data in said selected exercise mode on the basis of said waveform signal amplified by said amplifying means; and

announcing means for announcing the exercise data measured by said exercise-measuring means.

4,962,470

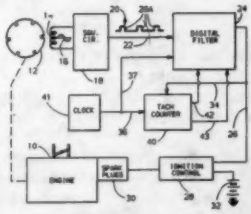
CRANKSHAFT PULSE POSITION DEVELOPING APPARATUS HAVING A SYNCHRONOUS DIGITAL FILTER

Mark C. Hansen, Kokomo, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.

Filed Aug. 1, 1988, Ser. No. 227,975

Int. Cl.[5] H03K *5/13*

U.S. Cl. 364—572 **4 Claims**



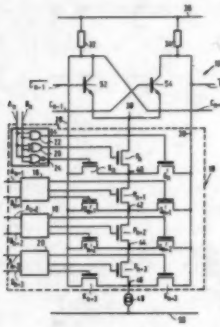
1. A digital system for providing a series of voltage pulses that occur at predetermined angular connections of a crankshaft of an internal combustion engine comprising, sensor means including means driven by said crankshaft for developing a square wave signal that has a plurality of high level pulses that occur at predetermined angular positions of the crankshaft separated by low level periods, the spacing between corresponding edges of said pulses corresponding to a predetermined amount of angular rotation of said crankshaft, synchronous digital filter means having an input coupled to said sensor means and an output, said digital filter means comprising a first pulse counter for determining whether or not the time periods of said high level pulses exceed first predetermined time periods and a second pulse counter for determining whether or not the time periods of said low level periods exceed second predetermined time periods, means coupled to said counters for preventing a high level voltage pulse of said square wave signal from being passed to said output when said high level voltage pulse has a time period that was determined to be less than said first predetermined time period, means coupled to said counters for passing a high to low level transition of said square wave to said output when just prior to said transition said square wave had a high level period that was longer than said first predetermined time period, and means coupled to said counters for preventing an input transition from being passed to said output when a high to low level transition has occurred and a subsequent input transition occurs at a duration of time after the high to low transition occurred that is less than said second predetermined time period.

4,962,471

HIGH SPEED DIGITAL CARRY LOOK AHEAD CIRCUIT FOR PARALLEL ADDER

Bernardus H. J. Cornelissen, Bergeijk, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 20, 1988, Ser. No. 260,155
Claims priority, application United Kingdom, Nov. 2, 1987, 8725625
Int. Cl.[5] G06F 7/42
U.S. Cl. 364—787 10 Claims



1. A carry look ahead circuit comprising:

a carry transfer stage; and

a logic network having symmetrical output nodes connected to the carry transfer stage, the carry transfer stage comprising:

a first active switching device and a second active switching device, each including a control terminal and a signal path controllable by means of its control terminal and connected between a common node for both switching devices and a respective load, the control terminals being adapted to receive respective mutually complementary input carry signals from a preceding carry look ahead circuit, symmetrical output carry signals being available at carry output nodes located between each load and its respective switching device, said carry output nodes being coupled to respective ones of the output nodes of the logic network;

the logic network comprising:

a plurality of groups of further switching devices, each group comprising:

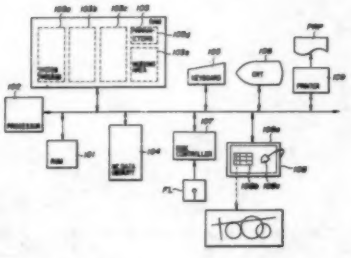
a third active switching device, a fourth active switching device and a fifth active switching device, each having a control terminal and a signal path controllable by means of its control terminal, means connecting the signal paths of the third and fourth switching devices in series between the output nodes of the logic network, the fifth switching device having its signal path connected to an internal node between the signal paths of the third and fourth switching devices, means connecting the signal paths of the fifth switching devices of the plurality of groups in series between the common node and a supply terminal, each group of further switching devices being responsive to a logical addition of two bits A_i, B_i of corresponding significance of two numbers to be added, a logical result $A_i{*}B_i$ being applied to the control terminal of the third switching device, a logical result A_i+B_i being applied to the control terminal of the fourth switching device, and a logical result $A_i \oplus B_i$ being applied to the control terminal of the fifth switching device.

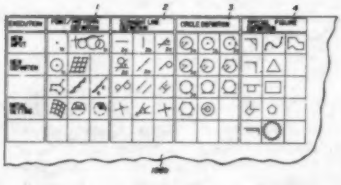
4,962,472

AUTOMATIC PROGRAMMING METHOD FOR OUTPUTTING FIGURE ELEMENTS OF PARTS AS WELL AS PART PROFILE DESCRIPTIONS IN RESPONSE TO A PART PROFILE REQUEST

Masaki Seki; Takashi Takegahara, and Katsunobu Yamaki, all of Tokyo, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP88/00220, § 371 Date Nov. 7, 1988, § 102(e) Date Nov. 7, 1988, PCT Pub. No. WO88/07228, PCT Pub. Date Sep. 22, 1988
PCT Filed Feb. 29, 1988, Ser. No. 273,035
Claims priority, application Japan, Mar. 12, 1987, 62-57305
Int. Cl.[5] G06F 9/00
U.S. Cl. 364—900 5 Claims





1. An automatic programming method for creating part profile data for numerical control, using a computer receiving input signals from an input device having a tablet surface with a menu table having menu items conforming to various methods of inputting figure data defining figure elements, including points, straight lines and circles constituting a part profile, said method comprising the steps of:

(a) displaying previously inputted figure elements on a display screen;

(b) designating a figure element definition method corresponding to one of the menu items on the menu table and a specific figure element displayed on the display screen;

(c) defining a new figure element using the figure element definition method and the specific figure element designated in step (b);

(d) executing processing using the figure data expressed in one of the first and second formats to produce part profile data; and

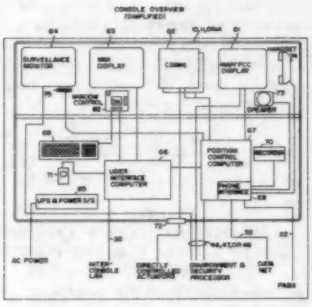
(e) storing the new and previously inputted figure elements and the part profile data in a memory in a first format indicating the various methods of defining and using a second format to store each point as coordinate values thereof, each straight line as coordinate values of two points and each circle as coordinates of the center and radius of the circle.

4,962,473

EMERGENCY ACTION SYSTEMS INCLUDING CONSOLE AND SECURITY MONITORING APPARATUS

Lawrence Crain, Pompton Lakes, N.J., assignor to ITT Corporation, New York, N.Y.

Filed Dec. 9, 1988, Ser. No. 283,439
Int. Cl.[5] G06F 15/16; G08B 5/22, 13/00
U.S. Cl. 364—900 21 Claims



1. An emergency action apparatus for use in an installation having a given floor plan format and maintained and operated by known, authorized personnel located on said installation, said installation requiring an intrusion detection system and a communications system, said emergency action apparatus providing an interface between said intrusion detection system and said communications system to enable a user to monitor said intrusion detection system and said communications system at a single location, comprising:

a console located at said location, said console including a position control computer in said console and having input means coupled to said communications system and operative to process data relating to said floor plan format of said installation,

a first display located on said console and coupled to said position control computer to display processed data from said computer indicative of said floor plan format,

a user interface computer located in said console and operative to process specialized databases containing information related to said personnel located in said installation to enable said user to determine the authorization of said personnel and including memory means having stored conference call data to enable said user to connect selected personnel together via said communications system to participate in a conference,

a second display located on said console and coupled to said user interface computer to enable data as processed by said computer to be displayed, said user interface computer coupled to said position control computer to enable data to be transferred between said computers,

means coupled to said memory means to enable said user to interface with said user interface computer via said second display wherein said user can set up conferences between personnel and display stored data regarding said personnel,

an environment and security processor (ESP) located remote from said console and coupled to said intrusion detection system for processing data regarding said intrusion detection system and for storing data related to said floor-plan format and to provide and process data indicative of monitored detection system functions and having output lines coupled to said position control computer and said first display, a video matrix coupled to said processor and controlled thereby to provide video signals as provided by said intrusion detection system,

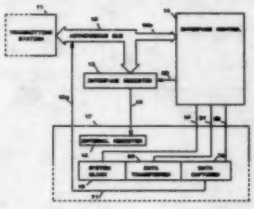
a third display located on said console and coupled to said environment and security processor to display, said video signals as controlled by said environment and security processor.

4,962,474

LSSD EDGE DETECTION LOGIC FOR ASYNCHRONOUS DATA INTERFACE

Paul D. Kreiser, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 17, 1987, Ser. No. 121,611
Int. Cl.[5] G06F 3/00
U.S. Cl. 364—900 14 Claims



1. An LSSD interface between a transmitting station and a computer clocked asynchronously to said transmitting station, comprising:

a. an edge triggered LSSD Flip flop having a first, arming input, and a second, set input;

b. first control means coupled to said transmitting station and said LSSD flip flop for developing an output signal for application to said set input for setting said flip flop to the state representative of data signal from said transmitting station in response to the presence of said data signal from said transmitting station; and,

c. means coupled to said LSSD flip flop and said computer and operating asynchronously to said transmitting station for applying a data transferred enabling signal from said computer to said first arming input to enable said flip flop to be set according to the input signal of said first control means whereby data may be transferred from said transmitting station to said computer which is clocked asynchronously to said transmitting station.

4,962,475

METHOD FOR GENERATING A DOCUMENT UTILIZING A PLURALITY OF WINDOWS ASSOCIATED WITH DIFFERENT DATA OBJECTS

Irene H. Hernandez, and Rex A. McCaskill, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 686,565, Dec. 26, 1984, abandoned.
This application Mar. 15, 1988, Ser. No. 168,368
Int. Cl.[5] G06F 3/153
U.S. Cl. 364—900 5 Claims

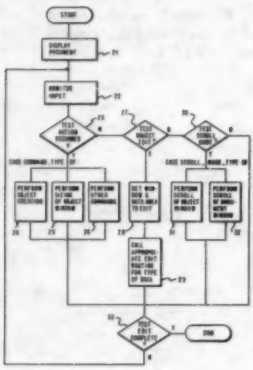
1. In a computer system having a display screen, a method of generating a tailored document from data objects making up a master document within said computer system, said method comprising the steps of:

(a) generating, responsive to operator control, computer system signals to display a portion of a plurality of said data objects of said master document in a plurality of windows on said display screen, respectively, with different portions in each of said plurality of windows thereby forming view ports into each of said plurality of data objects when selected;

(b) generating, responsive to operator control, computer system signals to scroll said portion of a selected one of said plurality of data objects in one of said plurality of windows corresponding thereto to position a desired portion of said selected one of said plurality data objects

viewable in said one of said plurality of windows for inclusion in said tailored document;

(c) repeating step (b) until a desired portion of each of the remaining ones of said plurality of data objects is positioned within a respective one of said plurality of windows; and



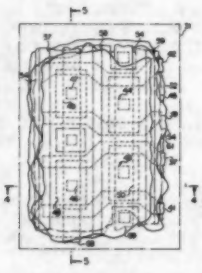
(d) generating, responsive to operator control, computer system signals to include each desired portion of said plurality of the respective data objects in said tailored document stored in said computer system upon a termination of the display of said plurality of windows while maintaining a link between said desired portions and said master document.

4,962,476

SEMICONDUCTOR MEMORY DEVICE HAVING BIT LINES LESS LIABLE TO HAVE INFLUENCES OF THE ADJACENT BIT LINES

Koji Kawada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 21, 1989, Ser. No. 383,397
Claims priority, application Japan, Jul. 26, 1988, 63-186011
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—53 **8 Claims**



1. A semiconductor memory device formed on a semiconductor substrate and comprising a plurality of memory cells and a plurality of word lines, each of said memory cells comprising

(a) a field effect transistor having source and drain regions formed in a surface portion of said semiconductor substrate and spaced apart from one another, and a gate electrode formed by one of said word lines and located over that area between the source and drain regions, and

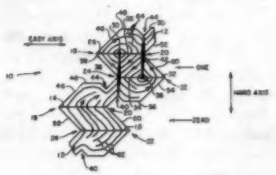
(b) a storage capacitor having a lower electrode coupled to one of said source and drain regions, a thin dielectric film formed on the lower electrode, and an upper electrode formed on the dielectric film and coupled to a constant voltage source, in which said semiconductor memory device further comprises an inter-level insulating film covering said field effect transistor and said storage capacitor, a plurality of bit lines formed on said inter-level insulating film in a spacing relationship from one another, an upper level insulating film covering said bit lines, and shield plates each formed in said upper level insulating film and provided between two of said bit lines, one of said bit lines passing through a contact window formed in said inter-level insulating film for contacting the other of said source and drain regions, and in which said shield plates is coupled to said upper electrode.

4,962,477

ENHANCED CROSSITE RANDOM ACCESS MEMORY ELEMENT AND A PROCESS FOR THE FABRICATION THEREOF

Leonard J. Schwee, Colesville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 20, 1983, Ser. No. 505,617
Int. Cl.[5] G11C *19/08*
U.S. Cl. 365—87 **8 Claims**



1. An enhanced crosstie random access memory element comprising:

a substrate;

a first level of polycrystalline magnetic material disposed on the top of said substrate and being configured into a plurality of juxtaposed sloped columns of geminous memory cells to form an array thereof, each one of said plurality of juxtaposed sloped columns of geminous memory cells being configured into a unique pattern of connected geminous memory cells;

a second level of insulating material disposed on the top of said first level and having vias for connecting through to each one of said plurality of juxtaposed sloped columns of geminous memory cells;

a third level of conducting material disposed on top of said second level and being configured into a plurality of juxtaposed row conductors which cross the array comprising said plurality of juxtaposed sloped columns of geminous memory cells above corresponding geminous memory cells thereof;

a fourth level of insulating material disposed on top of said third level and having vias for connecting through to each one of said plurality of juxtaposed row conductors; and

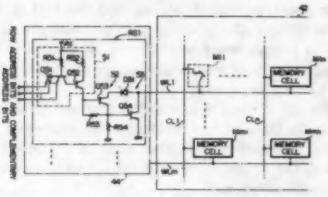
a fifth level of conducting material disposed on top of said fourth level and being configured into a plurality of juxtaposed meandering columns of "Z" shaped conductors each one being fabricated so as to follow the slope of corresponding ones of said juxtaposed sloped columns of geminous memory cells traversing above each geminous memory cell therein.

4,962,478

HIGH SPEED PROGRAMMABLE READ ONLY MEMORY DEVICE HAVING A HIGH INTEGRATION DENSITY AND DIODE IN THE PROGRAMMING PATH

Hajime Masuda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 13, 1989, Ser. No. 421,876
Claims priority, application Japan, Oct. 13, 1988, 63-258641
Int. Cl.[5] G11C *17/00*
U.S. Cl. 365—96 **8 Claims**



8. A programmable read only memory device fabricated on a semiconductor substrate of a first conductivity type and having a read out mode of operation and a write in mode of operation, comprising:

(a) a plurality of memory cells arranged in rows and columns and having respective elements each capable of being permanently changed in resistance with a large amount of a write in current, each of said memory cells being operative to store a data bit of either logic "1" or "0" level depending upon the resistance of the element of the memory cell;

(b) a plurality of row lines respectively coupled to the rows of said memory cells;

(c) a plurality of column lines respectively coupled to the columns of said memory cells;

(d) column selector means coupled to said column lines and responsive to column address bits and the complementary address bits thereof for supplying one or a plurality of said column lines with said write in current in said write in mode of operation and with a small amount of a read out current in said read out mode of operation;

(e) a row selector circuit having a plurality of row selector units respectively associated with said row lines, and responsive to row address bits and the complementary address bits thereof for selectively activating one of the row selector units, thereby providing a current path form one of said row lines to a first constant voltage source; and

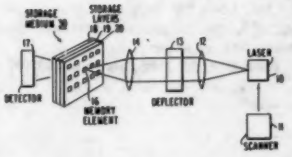
(f) an output circuit coupled to aforesaid one or plural column lines in said read out mode of operation to decide the voltage level or levels on the column line or lines for producing an output signal or signals representative of the data bit or bits stored in one or a plurality of the memory cells, in which each of said row selector units comprises e-1) a decoder stage responsive to a combination of a part of said row address bits and a part of said complementary address bits thereof and operative to produce a control current, said decoder stage comprising a first multiple emitter bipolar transistor having a plurality of emitter nodes supplied with the part of said row address bits and the part of said complementary address bits, a first resistor coupled between a second constant voltage source and the base node of the first multiple emitter bipolar transistor, a second bipolar transistor having a base node coupled to the collector node of the first multiple emitter bipolar transistor, and a second resistor coupled between the second constant voltage source and the collector node of the second bipolar transistor (e-2) an amplifier stage operative to turn on in the presence of the control current fed from the decoder stage for providing a conduction path, said amplifier stage comprising a third bipolar transistor having a base node coupled to the emitter node of the second bipolar transistor and a third resistor coupled between the base and emitter nodes of the third bipolar transistor. (e-3) an output stage including an output bipolar transistor having a base node coupled to a first end of the conduction path and capable of providing a collector to emitter conduction path between said associated word line and said first constant voltage source and a biasing resistor coupled between the base node of the output bipolar transistor and the first constant voltage source, and (e-4) a diode coupled between said associated word line and a second end of said conduction path, and in which said third bipolar transistor having a collector region of a second conductivity type formed on said semiconductor substrate, a base region of said first conductivity type formed in the collector region and an emitter region of the second conductivity type formed in the base region, wherein an impurity region of said first conductivity type is formed in a surface portion of said collector region for forming a combination said diode together with a part of the collector region.

4,962,479

OPTICAL DATA STORAGE SYSTEM WITH WAVELENGTH SELECTIVE LAMINATE

Hitoshi Imai, and Kazuo Okada, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1988, Ser. No. 195,759
Claims priority, application Japan, May 20, 1987, 62-124661
Int. Cl.[5] G11C *13/04*
U.S. Cl. 365—119 **6 Claims**



1. An optical data storage system, comprising:

(a) a storage medium defined by a plurality of individual layers of photochemical hole burning material disposed as a contiguous laminate, said layers individually exhibiting inhomogenous absorption spectrum characteristics spanning different, successive wavelength ranges, and

(b) means for subjecting an addressed memory site of the storage medium to a laser beam of sufficient intensity at selected wavelengths within an overall range encompassing said successive ranges to induce photochemical reactions in the storage medium layers such that the addressed memory site is thereafter substantially transparent to light at said selected wavelengths, thereby implementing the writing of data bits in the storage medium layers at the addressed memory site.

4,962,480

MEMORY READING APPARATUS

Manabu Ooumi; Toshihiko Sakuhara, and Tatsuaki Ataka, all of Tokyo, Japan, assignors to Seiko Instruments, Inc., Chiba, Japan

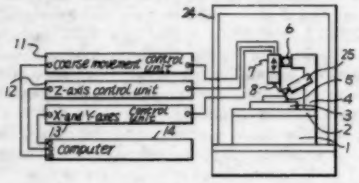
Filed Sep. 12, 1988, Ser. No. 243,514
Int. Cl.[5] G11C *13/00*; G01N *23/00*
U.S. Cl. 365—151 **13 Claims**

1. A memory reading apparatus comprising:

an output section for reading data bits stored in a memory having a surface and constituted, at the surface, by individual segments each having an atomic or molecular scale and each having a selected one of two physical states, the

value of each data bit being represented by the selected physical state of a respective segment, said output section comprising at least one needle having a fine tip portion dimensioned to address an individual memory segment; and

control means for controlling the output section, said control means comprising means for positioning the tip portion of the needle relative to the surface of the memory, means for scanning the tip portion of the needle over the surface of the memory and means for controlling a distance between the tip portion of the needle and each individual segment at the surface of the memory while the tip portion of the needle scans thereover to effect detection of the physical state of the individual segments to thereby read a data bit from each segment.

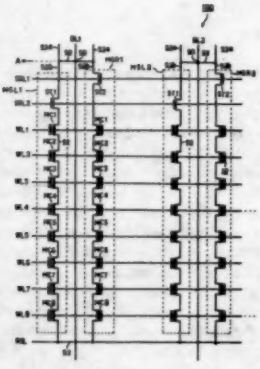


4,962,481

EEPROM DEVICE WITH PLURALITY OF MEMORY STRINGS MADE OF FLOATING GATE TRANSISTORS CONNECTED IN SERIES

Jung-Hyuk Choi; Soo-Chul Lee, and Hyung-Kyu Yim, all of Seoul, Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed Dec. 30, 1988, Ser. No. 292,107
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—185 **21 Claims**



1. An electrically erasable programmable semiconductor memory array, comprising:

a plurality of column lines;

a plurality of reference lines perpendicular to the column lines;

a plurality of memory strings arranged in a single column respectively disposed at both sides of each column line and in an upper and a lower row disposed between each adjacent one of said reference lines, each of upper and lower memory strings at one side of each of said column lines including a first transistor having a drain, a source and a gate and a first plurality of floating gate transistors each having a drain, a source, a floating gate and a control gate, with drain-source paths of the first transistor and the floating gate transistors of said first plurality being connected in series, each of upper and lower memory strings at the other side of the column including a second transistor having a drain, a source and a gate and a second plurality of floating gate transistors, drain-source paths of the second transistor and the floating gate transistors of said second plurality being connected in series, the first and second transistors and the floating gate transistors being arranged in an array of rows and columns, gates of the first and second transistors and the floating gate transistors in the upper memmory strings and the first and second transistors and the floating gate transistor in the lower memory strings being respectively connected to first and second select lines, each other upper word lines, third and fourth select lines and each other low word lines;

means for connecting drains of the first and second transistors to the column line through a single contact hole;

means for connecting the other ends of the serial connections in the upper memory strings to the reference line adjacent thereto; and

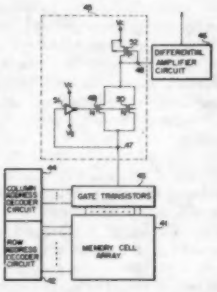
means for connecting the other ends of the serial connections in the lower memory strings to the reference line adjacent thereto.

4,962,482

NONVOLATILE MEMORY DEVICE USING A SENSE CIRCUIT INCLUDING VARIABLE THRESHOLD TRANSISTORS

Toshikatsu Jinbo, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 16, 1989, Ser. No. 311,255
Claims priority, application Japan, Feb. 19, 1988, 63-36851
Int. Cl.[5] G11C *7/00, 16/02*
U.S. Cl. 365—189.11 **9 Claims**



1. A sense circuit incorporated in a non-volatile semiconductor memory device having a plurality of memory cells and memory cell specifying means operative to specify one of the memory cells for reading out a data bit memorized therein, each of said memory cells having a conduction path or no conduction path between an input node and a first constant voltage source depending upon the data bit memorized therein, comprising;

(a) current supplying means coupled between a second constant voltage source different in voltage level from said first constant voltage source and an output node;

(b) a plurality of field effect transistors different in threshold voltage and having respective source-drain current paths directly inserted, in parallel, between said input node and said output node, said field effect transistors respectively having gate electrodes; and

(c) gating means coupled between said input node and said gate electrodes and responsive to a voltage level at the

input node for sequentially shifting said field effect transistors between on states and off states, thereby transferring the data bit memorized in said memory cell specified by said memory cell specifying means to said output node.

4,962,483

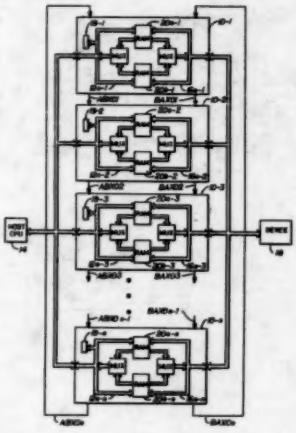
CASCADING FIFO MEMORY DEVICES FOR SEQUENTIAL STORING

Nusra Lodhi, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 908,559, Sep. 18, 1986, Pat. No. 4,847,812. This application Jun. 29, 1989, Ser. No. 373,743

Int. Cl.[5] G11C *7/00*

U.S. Cl. 365—221 **5 Claims**



1. Apparatus comprising a plurality of FIFO memories for receiving data from a data source, said data source providing said data on a data source bus, each FIFO memory including a plurality of locations for storing data, said FIFO memories being cascaded to function as a single FIFO memory, each FIFO memory within said plurality of FIFO memories comprising:

a data bus for coupling to said data source bus and receiving data from said data source;

first means for providing an output signal;

second means for receiving an input signal; and wherein for at least one of said FIFO memories within said plurality,

(a) when said input signal is in a first input signal state, said one FIFO memory is inhibited from storing said data from said data source,

(b) when said input signal goes from said first input signal state to a second input signal state, said one FIFO memory stores data from said data source in sequential locations within said one FIFO memory, and

(c) when the last location within said one FIFO memory is full, said output signal goes from a first output signal state to a second output signal state.

4,962,484

NON-VOLATILE MEMORY DEVICE

Masahiko Takeshima, and Naoki Mitsuishi, both of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 25, 1988, Ser. No. 148,078

Int. Cl.[5] G11C *13/00, 11/40*

U.S. Cl. 365—226 **11 Claims**

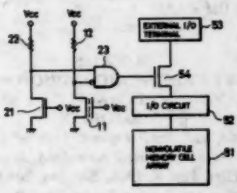
1. A non-volatile semiconductor memory device to be operated by a first voltage between a maximum rated value and a minimum rated value and a second voltage, the non-volatile semiconductor memory device comprising:

a plurality of external terminals comprising first terminals to receive the first voltage and the second voltage, and second terminals;

a plurality of non-volatile memory cells for storing information therein;

power supply voltage detection means, coupled to the first terminals, for generating a detection signal, the detection signal assuming a first detection level when the first voltage received by the first terminals is greater than the maximum rated value, and assuming a second detection level when the first voltage received by the first terminals is equal to or less than the maximum rated value;

security status control means for providing a data signal assuming a first protected level when the information stored in the plurality of non-volatile memory cells is in a protected mode, and assuming a second unprotected level when the information stored in the plurality of non-volatile memory cells is in an unprotected mode;



gate means, coupled to the power supply voltage detection means and to the security status control means, for producing a control signal assuming a first control potential when the detection signal is in the first detection level and also when the detection signal is in the second detection level and the data signal is in the first protected level, and assuming a second control potential when the detection signal is in the second detection level and the data signal is in the second unprotected level; and,

coupling means, disposed between the second terminals and the plurality of non-volatile memory cells, for coupling the plurality of non-volatile memory cells to the second terminals when the control signal is in the second control potential and for uncoupling the plurality of non-volatile memory cells from the second terminals when the control signal is in the first control potential.

4,962,485

NONCONTACTING IC CARD SUPPLIED WITH POWER FROM AN OUTSIDE SOURCE

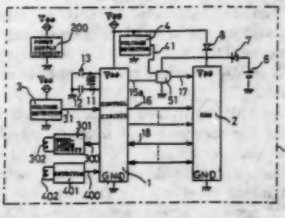
Yoshiaki Kato, Tsuushi; Harumi Yuyama, Yamanashi; Tutomu Ojima, Mizusawa, and Hiromi Ishikawa, Morioka, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1989, Ser. No. 309,880

Claims priority, application Japan, Feb. 16, 1988, 63-19061[U]

Int. Cl.[5] G11C *7/00*

U.S. Cl. 365—229 **12 Claims**



1. A non-contact IC card having a RAM, a control circuit

for controlling access to the RAM, a power supply circuit, for electro-magnetic non-contact connection to an outside source for receiving outside energy and converting it to electric energy to supply power to the RAM and the control circuit, a backup battery for maintaining data stored in the RAM, and input/output device for a reader/writer, comprising:

first voltage detection means, connected to the power supply circuit, for producing a starting signal for starting the control circuit when supply voltage from said power supply circuit exceeds a predetermined first reference voltage;

second voltage detection means, connected to the power supply circuit, for producing a control signal when the supply voltage from the power supply circuit exceeds a predetermined second reference voltage, which is greater than the predetermined first reference voltage;

gate means, responsive to both the starting signal and the control signal, for producing a RAM control signal for operating the RAM.

4,962,486

BOUNDARY-FREE SEMICONDUCTOR MEMORY DEVICE HAVING A PLURALITY OF SLIDE ACCESS MEMORIES

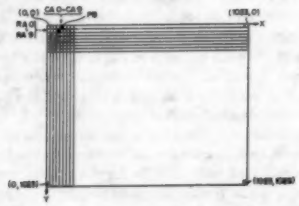
Yusuke Masuda, and Junji Ogawa, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 8, 1988, Ser. No. 204,135

Claims priority, application Japan, Jun. 10, 1987, 62-143254

Int. Cl.[5] G11C 7/00

U.S. Cl. 365—230.03 **12 Claims**



1. A semiconductor memory device comprising:

a plurality of slide access memories (SM_{00}, SM_{01}, . . . , and $SM_{n-1, m-1}$) incorporating input/output portions (704), in which a group of bits can be accessed;

data liners (D_0, D_1, . . . , D_{15}) commonly connected to the input/output portions of each of said slide access memories;

a first access means for accessing a same rectangular group of bits from each of said slide access memories to interconnect said groups of bits to corresponding input/output portions incorporated in said slide access memories;

a second access means for selecting each bit of the input/output portions to enable or disable operation of said selected input/output portions, to connect the rectangular groups of bits including a special bit (PB) to said data lines, wherein said second access means comprises:

decoder means (DECX, DECY) for generating a selection signal ($\overline{X}_{csi}$, $\overline{Y}_{csj}$) to select one of said slide access memories; and

logic means (703), provided in each of said slide access memories, for receiving said selection signal ($\overline{X}_{csi}$, $\overline{Y}_{csj}$) from said decoder means;

said logic means of one slide access memory selected by said decoder means receiving the same row and column addresses to generate access request signals (O_1, O_2, O_3) to other slide access memories adjacent to said selected slide access memory.

4,962,487

STATIC RANDOM ACCESS MEMORY DEVICE WITH POWER DOWN FUNCTION

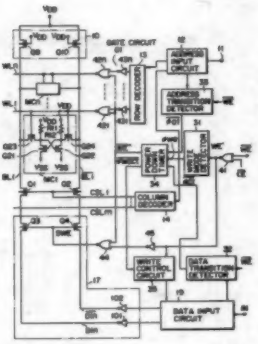
Azuma Suzuki, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 327,270, Mar. 22, 1989, abandoned. This application Feb. 21, 1990, Ser. No. 483,988

Claims priority, application Japan, Mar. 31, 1988, 63-78785

Int. Cl.[5] G11C 7/00

U.S. Cl. 365—233.5 **10 Claims**



1. A static random access memory device comprising:

a memory cell array having a plurality of static memory cells;

a pair of bit lines for transferring data to and from said memory cells in said memory cell array;

a write circuit for supplying write data to said bit line pair;

memory cell drive means for selectively driving one of said memory cells in accordance with a row address signal supplied from exterior;

write mode detecting means for detecting a signal state transition of a write enable signal changing to an active state;

input data transition detecting means for detecting a transition of the input data supplied from exterior, during a continuation of the active state of said write enable signal;

address signal transition detecting means for detecting a transition of an externally applied address signal during an active state of said write enable signal;

pulse signal generating means for generating a pulse signal with a predetermined pulse width in response to any of the detecting signals from said write mode detecting means, said input data transition detecting means, and said address signal transition detecting means;

drive control means for permitting said memory cell drive means to operate during a period that said pulse signal generating means generates a pulse signal, and for inhibiting said memory cell drive means from operating during a period that said pulse signal generating means rests; and

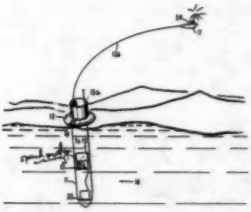
write circuit control means for supplying write data based on said input data to said write circuit during a period that said pulse signal generating means generates a pulse signal, and for supplying to said write circuit initial data to set said bit line pair at the same potentials during said period that said pulse signal generating means rests.

4,962,488

TECHNIQUE FOR SURFACE TO SURFACE COMMUNICATIONS USING HIGH FREQUENCY RADIO WITH LOW PROBABILITY OF INTERCEPT SIGNALING

Robert A. Dell-Imagine, Orange; Millard J. Parrish, Fountain Valley, and John A. Carnaghie, Cerritos, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 31, 1989, Ser. No. 304,543
Int. Cl.[5] H04B *1/59*
U.S. Cl. 367—3 **9 Claims**



4. Communication apparatus for a vehicle submerged below the surface of a body of water, said communication apparatus comprising:

a water-tight floatable enclosure adapted to be launched from the submerged vehicle;

a tether containing an optical fiber operatively linked between the submerged vehicle and the floatable enclosure;

a surface sensor coupled to the floatable enclosure adapted to provide a signal;

a flexible wire antenna deployable from the enclosure;

an inflatable aerodynamic lifting body coupled to one end of the wire antenna for erecting the wire antenna to a predetermined height above the water surface, the lifting body being inflatable with a lighter-than-air gas in response to the signal from the surface sensor, the lifting body being aerodynamically shaped to provide lift in the presence of wind;

a radio transceiver adapted to operate in the high frequency band disposed in the floatable enclosure and being operatively coupled to the optical fiber and to the wire antenna; and

spread spectrum modulation and demodulation means operatively incorporated in the radio transceiver for suppressing multipath fading and decreasing the probability of detection.

4,962,489

ACOUSTIC BOREHOLE LOGGING

William L. Medlin, Dallas, and Stephen J. Manzi, Carrollton, both of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

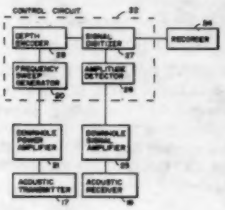
Continuation of Ser. No. 331,152, Mar. 31, 1989, abandoned. This application Mar. 26, 1990, Ser. No. 501,392
Int. Cl.[5] G01V *1/40*; G01N *29/00*
U.S. Cl. 367—32 **9 Claims**

1. An acoustic borehole logging method comprising the steps of:

(a) traversing a borehole with a borehole logging tool containing a transmitter of acoustic energy having a free-field frequency spectrum with at least one characteristic resonant frequency of vibration and a spaced-apart receiver,

(b) repeatedly exciting said transmitter with a swept frequency tone burst of a duration sufficiently greater than the travel time of acoustic energy between said transmitter and said receiver to allow borehole cavity resonances to be established within the borehole cavity formed between the borehole logging tool and the borehole wall,

(c) detecting acoustic energy amplitude modulated by said borehole cavity resonances with said spaced-apart receiver, and



(d) recording an amplitude versus frequency output of said receiver in correlation with depth as a log of the borehole frequency spectrum representative of the subsurface formation comprising the borehole wall.

4,962,490

ACOUSTIC LOGGING METHOD FOR DETERMINING THE DIP ANGLE AND DIP DIRECTION OF A SUBSURFACE FORMATION FRACTURE

W. D. Lyle, and D. Michael Williams, both of Grapevine, Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jan. 18, 1990, Ser. No. 467,109
Int. Cl.[5] G01V *1/40*
U.S. Cl. 367—35 **3 Claims**

1. A method for determining the dip angle and dip direction of a formation fracture intersecting a borehole, comprising the steps of:

(a) conducting a borehole televiewer acoustic logging survey of the formations surrounding a borehole and intersected by a formation fracture,

(b) determining the relative fracture dip angle and dip direction with respect to the borehole axis from said borehole logging survey,

(c) calculating from said relative dip angle and dip direction three perpendicular vector components representing a normal to the fracture plane,

(d) determining a borehole azimuth angle ψ and a borehole deviation angle δ, said borehole azimuth angle ψ being a drift direction of the borehole represented by 360° minus the angle between the high side of the borehole and magnetic North, and said borehole deviation angle δ being a drift angle of deviation of the borehole from a vertical,

(e) combining said borehole azimuth angle ψ and said borehole deviation angle δ to yield a new angle ϵ as follows:

$$\epsilon = Sgn\,[\psi]^{*}\cos^{-1}\left[\cos\delta\cos\psi/(\cos^{2}\psi+\sin^{2}\psi)^{\frac{1}{2}}\right],$$

where

$$Sgn = \begin{cases} 1, \psi > 0 \\ 1, \psi = 0 \\ -1, \psi < 0 \end{cases}$$

ψ = borehole azimuth angle, and
δ = borehole deviation angle

(f) calculating a matrix operator R from said borehole azimuth angle ψ, said deviation angle δ and said angle ϵ which transforms the three perpendicular vector components of said normal to the fracture plane to three perpendicular vector components in the earth's coordinate system,

(g) calculating said vector components in the earth's coordi-

nate system from said matrix operator and said vector components of the normal to the fracture plane, and

(h) calculating true fracture dip angle and dip direction from said vector components in the earth's coordinate system.

4,962,491

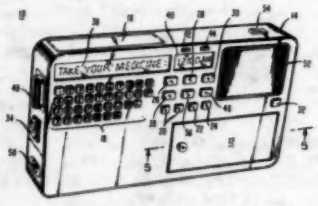
MEDICAMENT DISPENSER AND MEDICAL INFORMATION STORAGE APPARATUS

Theodore S. Schaeffer, 86 Russell Ave., Rahway, N.J. 07065

Continuation-in-part of Ser. No. 257,462, Oct. 13, 1988, abandoned. This application Feb. 12, 1990, Ser. No. 478,227

Int. Cl.[5] G04B *47/00*; B65B *59/00*

U.S. Cl. 368—21 **11 Claims**



1. A medicament dispenser and medical information storage apparatus comprising a housing, said housing having an alpha/numeric keyboard affixed thereto, said housing having at least one visual information display secured to said housing, a plurality of control function keys affixed to said housing, a controller, said alpha/numeric keyboard and said plurality of control function keys coupled to and electrically operating said controller, an audio device, said audio device coupled to said controller, means by which at least a portion of said visual information display is operable at selected points in real time inclusive of means to maintain said portion of said visual information display operable until a manual operation of one of said plurality of control function keys, means to maintain another portion of said visual information display operable at all times, said housing having a compartment, said compartment being configured having an access cover hingeably secured to said housing to accept for temporary storage therewithin a plurality of medicaments of various types and quantities, a spring loaded locking mechanism, said locking mechanism being secured to said housing, means whereby said locking mechanism is momentarily operated at said selected points in real time permitting the opening of said access cover so as to provide access to said plurality of medicaments stored within said compartment, means whereby said locking mechanism locks said access cover upon the manual closing of said access cover after selected medicaments are withdrawn from said compartment.

4,962,492

MAGNETO-OPTIC DATA RECORDING SYSTEM, ACTUATING DEVICE THEREFOR AND METHOD OF PROVIDING SAME

Gerardus L. Mathildus, Cascade; Matthew W. Hecht, Louisville, and Robert A. Briones, Colorado Springs, all of Colo., assignors to Laser Magnetic Storage International Company, Colorado Springs, Colo.

Filed Apr. 29, 1988, Ser. No. 188,261

Int. Cl.[5] G11B *13/04*

U.S. Cl. 369—13 **25 Claims**

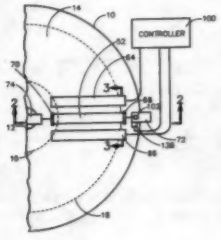
1. A magneto-optic data recording apparatus comprising:

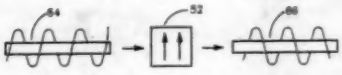
a magneto-optic medium which can be magnetized by exposure to a magnetic field of a first magnitude when heated to a first temperature and which does not become magnetized upon exposure to a magnetic field of said first magnitude when the temperature of said medium is less than about said first temperature;

light means for heating a first portion of said medium to at least said first temperature wherein portions of said medium adjacent to said first portion are at a temperature less than said first temperature;

a permanent magnet having a first axis, a first part, and second part and a magnetic field with a magnitude at least equal to said first magnitude;

means for positioning said permanent magnet wherein at least said first part is adjacent to said first portion of said medium and said magnetic field has a first polarity relative to said magneto-optic medium; and





means for reversing the polarity of the magnetic field adjacent to said first portion by turning said permanent magnet about said first axis while avoiding contact of said permanent magnet with said magneto-optic medium to a position in which at least said second part is adjacent to said first portion of said medium and said magnetic field has a second polarity relative to said magneto-optic medium substantially opposite to said first polarity, said means for reversing including means for generating an external magnetic field that is substantially parallel to said magneto-optic medium, wherein said reversal of said polarity is accomplished in less than a predetermined time interval.

4,962,493

RECORD CARRIER WITH A FOLLOW-ON TRACK AND APPARATUS FOR RECORDING INFORMATION THEREON

Pieter Kramer, and Jan Roos, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 499,571, May 31, 1983, Pat. No. 4,807,209, which is a continuation of Ser. No. 318,169, Nov. 4, 1981, abandoned, which is a continuation of Ser. No. 127,354, Mar. 5, 1980, abandoned, which is a continuation of Ser. No. 902,713, May 4, 1978, abandoned, which is a continuation of Ser. No. 619,039, Oct. 2, 1975, abandoned, which is a continuation of Ser. No. 431,422, Jan. 7, 1974, abandoned. This application Oct. 25, 1988, Ser. No. 262,555

Claims priority, application Netherlands, Feb. 9, 1973, 7301830

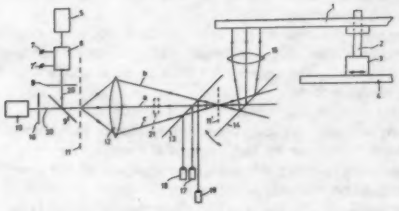
The portion of the term of this patent subsequent to Feb. 21, 2006, has been disclaimed.

Int. Cl.[5] G11B *7/095*, *7/00*

U.S. Cl. 369—44.11 **11 Claims**

11. A record carrier body for recording thereon information with a write beam of radiation, said record carrier body having a radiation-sensitive layer on which the information to be recorded is written with the write beam and a diffractive

follow-on track in the form of an elongated groove formed in said record carrier body for guiding the write beam during recording of the information, said groove being configured to diffract radiation incident thereon when scanned with a spot of radiation of a predetermined size and having a width which is



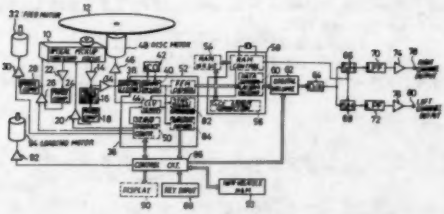
smaller than the dimension of the spot in the width direction so that the intensity distribution of the radiation coming from the record carrier body varies with movement of the spot relative to the center of said groove due to said diffraction so as to enable the position of the spot relative to said groove to be determined.

4,962,494

OPTICAL DISK PLAYBACK DEVICE HAVING AUTOMATIC VOLUME CONTROL

Shigenobu Kimura, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed May 11, 1987, Ser. No. 48,301
Claims priority, application Japan, May 15, 1986, 61-111181
Int. Cl.[5] G11B *19/12*
U.S. Cl. 369—48 **3 Claims**



1. A disk playback device capable of automatically adjusting the tone volume of a signal reproduced from a disc, comprising:

disc identifying means for uniquely identifying a disc loaded in the disc playback device and for providing disc identifying data;

tone volume setting means for setting the tone volume of a signal reproduced from the disc;

memory means for storing tone volume data for each disc set by said tone volume setting means together with disc identifying data provided by said disc identifying means;

automatic tone volume adjusting means for reading out set tone volume data corresponding to the disc identifying data provided by said disc identifying means from said memory means when said disc has been loaded in the disc playback device and automatically adjusting said tone volume setting means in correspondence with the set tone volume data; and

manual tone volume adjusting means for manually adjusting the tone volume data set by said tone volume setting means;

wherein said automatic tone volume adjusting means causes, when the manual operation of said manual tone volume adjusting means has been made, the set tone volume data provided by the manual adjustment and the disc identifying data to be stored in said memory means; and

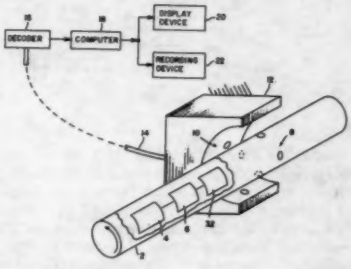
wherein said automatic tone volume adjusting means adjusts said tone volume setting means to predetermined tone volume data when data corresponding to the disc identifying data of the disc identified by said disc identifying means is not stored in said memory means.

4,962,495

APPARATUS AND METHOD FOR TRANSMITTING CONDITION DATA FROM A ROTATING MEMBER TO A STATIONARY DEVICE

Charles B. Gibbons, Whitesboro, and Victor R. Abate, Utica, both of N.Y., assignors to Lucas Aerospace Power Transmission Corp., Utica, N.Y.

Filed Oct. 3, 1988, Ser. No. 252,632
Int. Cl.[5] H04J *14/00*; H04B *10/00*
U.S. Cl. 370—1 **16 Claims**



1. Apparatus for transmitting rotating member condition data from the rotating member to a stationary device comprising:

sensor means arranged to rotate with the rotating member for sensing predetermined rotating member conditions and for providing corresponding electrical analog signals;

means arranged to rotate with the rotating member connected to the sensor means for acquiring the analog signals therefrom and for converting said signals to digital signals including multiplexer means connected to the sensor means for selecting the electrical analog signals therefrom and for outputting the selected signals in a predetermined sequence, sample and hold means connected to the multiplexer means for sampling and holding the electrical analog signals outputted thereby and for providing sampled signals at a predetermined rate, analog to digital converter means and for converting the sampled signals to digital signals, and means connected between the multiplexer means and the sample and hold means for adjusting the amplitude of the signals outputted by said multiplexer means so that said amplitudes match a predetermined amplitude range of the analog to digital converter means;

means arranged to rotate with the rotating member connected to the acquiring and converting means to control said means to acquire and convert the analog signals to digital signals, and responsive to the digital signals for providing electrical signals in accordance with a predetermined digital code;

means arranged to rotate with the rotating member connected to the means for providing electrical signals in accordance with a predetermined digital code and responsive to the signals therefrom for providing light signals in accordance with said digital code;

means connected to the means for providing the light signals for receiving said signals;

a decoder;

light transmitting means coupled to the receiving means and

to the decoder for transmitting the light signals received in accordance with the digital code from the output of the receiving means to the decoder, with the input of the decoder decoding the transmitted signals and providing corresponding electrical digital signals; and

means connected to the decoder for utilizing the electrical digital signals.

4,962,496

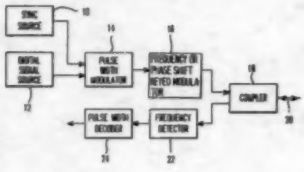
TRANSMISSION OF DATA VIA POWER LINES

Leonard C. Vercellotti, Oakmont, and Dirk J. Boomgaard, Monroeville, both of Pa., assignors to ABB Power T & D Company Inc., Blue Bell, Pa.

Filed Oct. 20, 1988, Ser. No. 260,343

Int. Cl.[5] H04J *15/00*; H04L *27/32*

U.S. Cl. 370—11 **6 Claims**



1. A method for transmitting data via a power line which also carries a mains voltage which varies in amplitude to have a succession of zero crossings which occur at the frequency of the mains voltage, the data being contained in a sequence of binary data words each containing information, and the data being transmitted over the power line according to a first communications protocol which provides a signal varying between two signal states during successive intervals, with the duration of each interval defining the value of a respective data word bit, the power line also being connected to carry data according to a different protocol in which bursts of a signal are synchronized to zero crossings of the mains voltage, said method comprising: producing a carrier which is continuous at least for the duration of each data word; angularly modulating the carrier in accordance with the information contained in each data word; and transmitting the continuous angularly modulated carrier over the power line.

4,962,497

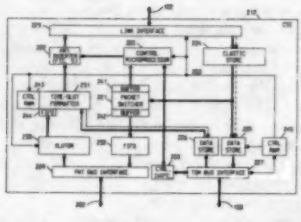
BUILDING-BLOCK ARCHITECTURE OF A MULTI-NODE CIRCUIT-AND PACKET-SWITCHING SYSTEM

James J. Ferenc, Boulder, Colo.; Louis R. Goke, Austin, Tex.; Gary J. Grimes, Thornton, Colo., and Bryan S. Moffitt, Redbank, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 21, 1989, Ser. No. 410,774

Int. Cl.[5] H04Q *11/04*

U.S. Cl. 370—60.1 **14 Claims**



1. A circuit- and packet-switching unit of a switching node for a switching system having one or more communication switching nodes each including a plurality of circuit- and packet-switching units comprising:

means connectable to either one of a communication endpoint or a unit of another switching node, for receiving simultaneously a plurality of multiplexed circuit- and packet-switched communications in a same format from a connected either one of the endpoint or the unit of the other switching node;

means connectable to the units of the switching node that includes the unit, for broadcasting all communications received by the receiving means to each unit within the switching node;

means connectable to the units of the switching node that includes the unit and responsive to receipt of communications broadcast by the units of the switching node that includes the unit, for determining which of the received broadcast communications are destined for receipt or transmission by the unit and discarding all other received broadcast communications;

means responsive to information included in received broadcast communications that are destined for receipt by the unit, for multiplexing together received broadcast circuit- and packet-switched communications that are received from a plurality of the units of the switching node that includes the unit and are destined for transmission by the unit; and

means connectable to either one of a communication endpoint or a unit of another switching node, for transmitting simultaneously a plurality of circuit- and packet-switched communications multiplexed together by the multiplexing means in the same format to a connected either one of the endpoint or the unit of the other switching node.

4,962,498

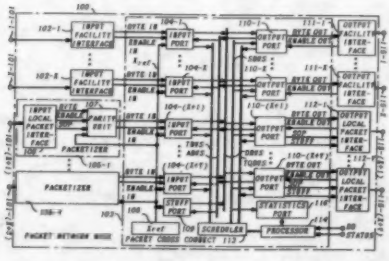
MULTI-LENGTH PACKET FORMAT INCLUDING CHECK SEQUENCE(S)

Carl J. May, Jr., Holmdel, N.J., assignor to AT & T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 23, 1989, Ser. No. 371,236

Int. Cl.[5] H04J *03/24*

U.S. Cl. 370—94.1 **19 Claims**



1. Apparatus for generating a packet including at least a transport word, i.e., header, comprising:

means for generating said transport word including a predetermined number of groups of bit positions each including a predetermined number of bit positions, predetermined ones of said transport word bit positions forming a packet length indicator field, a predetermined number of said transport word bit positions forming an at least one prescribed parity check field and a predetermined number of said transport word bit positions forming an at least second prescribed parity check field;

means for obtaining the length of said packet;

means for inserting bits representative of said packet length in bit positions of said packet length indicator field;

means for generating an at least first prescribed parity check

from bits in predetermined bit positions of said transport word;

means for generating an at least second prescribed parity check from bits in predetermined bit positions of said transport word;

means for inserting a number of bits representative of said at least first prescribed parity check into said number of bit positions of said at least one prescribed parity check field; and

means for inserting a number of bits representative of said at least second prescribed parity check in said number of bit positions of said at least second partiy check field, said at least first prescribed parity check, said at least second prescribed parity check and said packet length indicator being employed to delimit said packet.

4,962,499

SWITCHING SYSTEM FOR SWITCHING PACKET ORIENTED DATA AS WELL AS CIRCUIT ORIENTED DATA

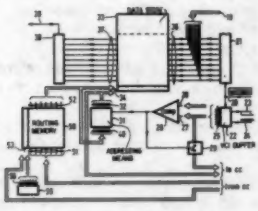
Ronald T. Sennema, Hilversum, Netherlands, assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 2, 1989, Ser. No. 360,496

Claims priority, application Netherlands, Jun. 9, 1988, 8801481

Int. Cl.[5] H04J *3/24*

U.S. Cl. 370—94.1 **2 Claims**



1. A switching system for switching packet oriented data and circuit oriented data, characterized in that this switching system comprises at least one input timer stage capable of switching circuit oriented data, this input timer stage comprising:

a data store which is operated in a controlled output mode, which data store comprises:

a data input which is connected to an incoming packet bus via transfer means for undelayed transfer of a packet upon receipt,

a data output; and

an address input;

an addressing arrangement for producing write addresses that are destined for the data store and a central controller, which addressing arrangement comprises:

a data output which is connected to the address input of the data store and to the central controller; and

a control input which is arranged for receiving a packet signal for producing a write address in response to the detection of a packet;

a VCI buffer for applying to the central controller a virtual circuit identifier associated to a packet, to be called VCI hereinafter, which VCI buffer has:

an input which is connected to the incoming packet bus; and

an output which allows to be connected to the central controller; and

a routing memory for producing per packet to be read the relevant data store address, which routing memory comprises:

a data output which is connected to the address input of the data store,

a data input which allows to be connected to the central controller, and

an address input which is optionally connectable to a counter or to the central controller,

The address input of the data store being optionally connectable to the data output of the addressing arrangement or the data output of the routing memory.

4,962,500

DATA PROCESSOR INCLUDING TESTING STRUCTURE FOR A BARREL SHIFTER

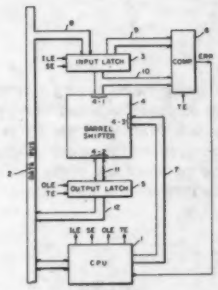
Katsuhiko Nakagawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 26, 1988, Ser. No. 236,834

Claims priority, application Japan, Aug. 28, 1987, 62-215611

Int. Cl.[5] G06F *11/16*

U.S. Cl. 371—24 **8 Claims**



1. A data processor, comprising:

a barrel shifter having a plurality of input terminals, a plurality of output terminals, and a plurality of control terminals supplied with shift control data representative of a shift values;

first data supplying means for supplying first data, to be shifted, to said input terminals of said barrel shifter;

second data storing means for storing second data derived from said output terminals of said barrel shifter as a shifted result;

returning means for returning said second data to said output terminals of said barrel shifter from said second data storing means to derive third data from said input terminals of said barrel shifter, said third data being obtained by feeding said returned second data back to said input terminals through said barrel shifter; and

means, coupled to said first data supplying means and to said input terminals of said barrel shifter, for comparing said third data with said first data and for outputting a comparison result signal.

4,962,501

BUS DATA TRANSMISSION VERIFICATION SYSTEM

Larry L. Byers, Apple Valley; James H. Scheuneman, St. Paul, and Joseba M. Desubijana, Minneapolis, all of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Sep. 13, 1988, Ser. No. 244,187

Int. Cl.[5] G06F *11/10*

U.S. Cl. 371—51.1 **6 Claims**

1. A bus data transmission verification system, comprising:

a read data bus,

a write data bus,

a plurality of transmitting and receiving card elements, each being coupled between said data buses,

input and output communicaiton path means coupling said card elements between said data buses,

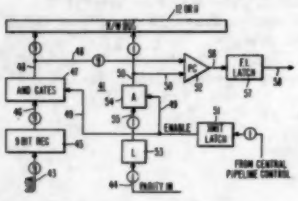
fault indicating circuit means coupled in series in said input

and the output comunication paths means between each of said transmitting and receiving elements and said buses,

said fault indicating circuit means comprising logic gating means for parity checking a plurality of data bytes of a data word,

said logic gating means for parity checking having a plurality of parallel connected bit registers,

each said bit register having a data byte input and a parity bit input connected thereto,



each said logic gating means having a parity check circuit coupled to the output of each said bit register for generating error signals indicative of byte errors, and

said fault indicating circuit means comprising storage means coupled to the output of said parity checking circuits for storing signals indicative of data byte errors in said data word.

4,962,502

OPTICAL SIGNAL PROCESSING DEVICE

Michael J. Adams, Ipswich, England, assignor to British Telecommunications public limited company, Great Britain

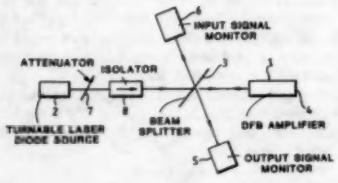
PCT No. PCT/GB87/00904, § 371 Date Aug. 11, 1988, § 102(e) Date Aug. 11, 1988, PCT Pub. No. WO88/04790, PCT Pub. Date Jun. 30, 1988

PCT Filed Dec. 14, 1987, Ser. No. 230,835

Claims priority, application United Kingdom, Dec. 15, 1986, 8629873

Int. Cl.[5] H01S *3/30*

U.S. Cl. 372—8 **11 Claims**



1. An optical signal processing device comprising:

a semiconductor DFB laser amplifier operated in reflection, said amplifier producing an optical output signal and having at least one stop band with a short wavelength side,

means for coupling an optical input signal to the amplifier, said input signal having an optical frequency disposed to said short wavelength side of said amplifier stop band, and

means for applying a driving current to the amplifier of less than a lasing threshold for the amplifier, said input signal an intensity greater than a threshold value above which the intensity of said amplifier output signal is substantially independent of said input signal intensity thereby limiting the optical output signal intensity.

4,962,503

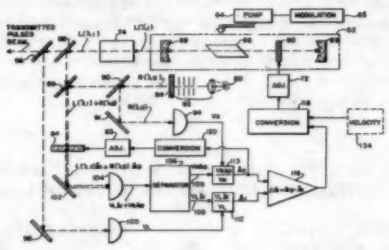
WAVELENGTH STABILIZATION FOR A PULSED TUNABLE LASER

Chi-Sheng Liu, Monroeville Boro, Pa., and Koon W. Loh, Chatham, N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 13, 1984, Ser. No. 670,731

Int. Cl.[5] H01S *3/13*

U.S. Cl. 372—32 **7 Claims**



1. Laser apparatus comprising:

A) a pulsed laser operable to provide a pulsed output laser beam;

B) an adjustable etalon positioned in the beam path within the resonant cavity of said laser to tune said laser;

C) means for providing a CW reference beam having a wavelength of said laser beam;

D) detection means;

E) means to direct samples of said laser and reference beams to said detection means for the production of corresponding output signals;

F) another adjustable etalon positioned in the path of a sampled laser and reference beam, prior to said detection means;

G) circuit means responsive to said output signals for deriving first and second feedback control signals; and

H) means responsive to said first and second feed-back control signals for respectively adjusting said etalons.

4,962,504

MIXED LANTHANIDE-MAGNESIUM ALUMINATES AND LASERS USING MONOCRYSTALS OF THESE ALUMINATES

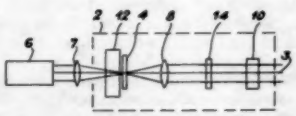
Jean-Jacques Aubert, Le Fontanil-Cornillos; Anne-Marie Lejus, Montrouge; Bruno Viana, Mandres-Les-Roses, and Daniel Vivien, Garches, all of France, assignors to Centre National de la Recherche Scientifique, Tole and Commissariat a l'Energie Atomique, Paris, both of, France

Division of Ser. No. 62,882, Jun. 16, 1986. This application Apr. 12, 1989, Ser. No. 336,748

Claims priority, application France, Jun, 16, 1986, 89 08660

Int. Cl.[5] H01S *3/16*

U.S. Cl. 372—41 **12 Claims**



1. A laser comprising a laser emitter monocrystal of a mixed lanthanide-magnesium aluminate of the formula: $(La_{1-x}Tr_x)_{1-y-p}Mg_{1-z-t}Al_{11-u+y+2z/3}Cr_uO_{19-t-3t/2}$ in which Tr represents; at least one single trivalent substance selected from the group consisting of; yttrium, scandium, and lanthanides other than lanthanum except when u is $\neq 0$ and at least one pair of lanthanides other than lanthanum except when u is $\neq 0$ formed from a divalent element and a trivalent element, said

pair of lanthanides retaining their electrical neutrality by adding aluminum or oxygen deficiencies, and any combination of said single trivalent substance and lanthanide pairs; x represents a number such that $0 \leqq x < 1$; y and v represent numbers such that $0 \leqq y+v \leqq 0.4$; z and t represent numbers such that $0 \leqq z+t < 1$, and that when $y+v=0$, $z+t \neq 0$, provided that when $z+t=0$, $y+v$ is $\neq 0$ for Tr representing a single trivalent lanthanide; u represents a number from 0 to 2, provided that when Tr represents y^{3+} or Sc^{3+}, u is $\neq 0$, that when $x=0$, u is $\neq 0$ and that when $u=0$, x is $\neq 0$, said aluminate being a monophase and having a magnetoplumbite type structure.

4,962,505

SOLID-STATE LASER DEVICE HAVING A HIGH CONVERSION EFFICIENCY BETWEEN ELECTRIC POWER AND OUTPUT POWER AND A LAMP DEVICE THEREFOR

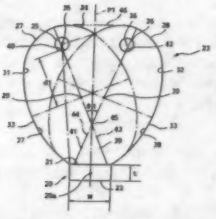
Takayasu Mochizuki; Josef R. Unternahrer, both of Tokyo, and Mitsuhisa Moriyama, Kanagawa, all of Japan, assignors to Hoya Corporation and Research Development Corporation, both of Tokyo, Japan

Filed Jan. 30, 1989, Ser. No. 303,922

Claims priority, application Japan, Jan. 30, 1988, 63-20809; Sep. 30, 1988, 63-248520

Int. Cl.[5] H01S *3/093*

U.S. Cl. 372—72 **20 Claims**



1. In a solid-state laser device comprising a slab shaped medium having an optical axis and a principal surface parallel to said optical axis, a reflector member having an internal wall surface for defining an internal space, an d first and second excitation lamps extended along said optical axis within said internal space, the improvement wherein said reflector member comprises:

first and second curved portions having first and second reflector axes parallel to said optical axis and first and second arcuate internal surfaces, respectively, which are contiguous to each other and which surround said first and said second reflector axes, respectively; and

an extension portion extended from said first and said second curved portions towards said principal surface for defining said internal space together with said first and said second curved portions;

said first and said second excitation lamps having first and second lamp axes which are farther from said principal surface than said first and said second reflector axes, respectively, and which are juxtaposed to said first and said second reflector axes and to said optical axis.

4,962,506

SCATTER SYMMETRIZATION IN MULTI-MODE RING LASER GYROS

John P. Rahn, Canoga Park, and David Hall, La Crescenta, both of Calif., assignors to Litton Systems, Inc., Woodland Hills, Calif.

Filed Apr. 14, 1988, Ser. No. 181,490

Int. Cl.[5] H01S *3/083*

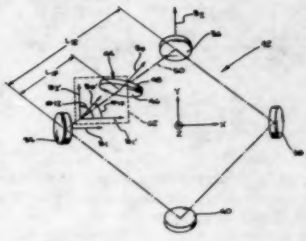
U.S. Cl. 372—94 **12 Claims**

1. In a multi-oscillator ring laser gyro, an apparatus for achieving scatter symmetrization, comprising:

a ring laser gyro cavity having an active region acting as a source of bi-directional coherent light, said light providing at least four modes of cavity propagating waves, two of said modes forming a right circularly polarized beam set, and two of said modes forming a left circularly polarized beam set;

said laser gyro cavity having at least four optically reflective elements forming at least four legs of said cavity;

at least two of said reflective elements forming one of said at least four legs of said gyro cavity;



the reflective elements being oriented with respect to each other so that the amount of image rotation for each leg is proportional to the length of each leg;

whereby, scatter symmetrization of the scatter coupled right and left circularly polarized sets of beams is achieved.

4,962,507

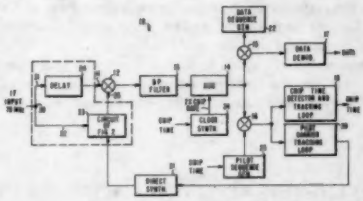
FEED FORWARD SPREAD SPECTRUM SIGNAL PROCESSOR

Kenneth H. Renshaw, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 29, 1989, Ser. No. 415,165

Int. Cl.[5] H04K *1/00*

U.S. Cl. 375—1 **12 Claims**



1. A comunications receiver for receiving a code-division multiple access spread spectrum signal having a plurality of data carriers and a timing reference pilot carrier, said receiver comprising:

detector means responsive to the spread spectrum signal for detecting the pilot carrier;

means for determining the level of communication link phase noise present in the pilot carrier, said level of communication link phase noise being substantially identical to the level of phase noise present in the spread spectrum signal;

means responsive to said determining means for generating a mixer input signal representative of said level of communication link phase noise; and

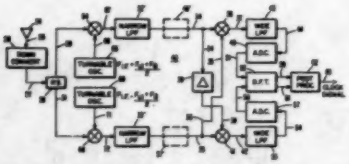
mixer means responsive to the spread spectrum signal and responsive to said mixer input signal for subtracting said communication link phase noise from the date carriers.

4,962,508

DUAL CHANNEL INTERFERENCE CANCELLER

Samuel C. Kingston, Salt Lake City, Utah, assignor to Unisys Corporation, Blue Bell, Pa.

Filed Sep. 18, 1986, Ser. No. 908,831
Int. Cl.[5] H04K *1/00*
U.S. Cl. 375—1 7 Claims



1. A circuit for detecting the presence or absence of a periodically keyed random modulated signal source containing interference signals comprising:

receiving means for receiving periodically keyed random modulated signals,

means for converting said received periodically keyed random modulated signals to a pair of intermediate frequency signals having continuous wave interference signals thereon,

a first dual channel detection circuit comprising a first mixer coupled to one of said intermediate frequency signals,

a second dual channel detection circuit comprising a second mixer coupled to the other of said intermediate frequency signals,

a delay coupled to said first dual channel detection circuit and to said second mixer,

a line coupled to said second dual channel detection circuit and to said first mixer,

first wide low pass filter menas coupled to the output of said first mixer to provide only the real signal component,

second wide low pass filter means coupled to the output of said second mixer to provide only the imaginary signal component,

a discrete Fourier transform device coupled to said real and said imaginary signal components containing carrier wave interference signals for performing spectrum analysis of said signal components and to provide real and imaginary transform data outputs, and

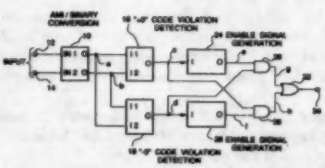
a post processor coupled to said real and said imaginary data outputs for detecting the presence of clock signals in said received signals and cancelling out the carrier wave interference signals.

4,962,509

CODE VIOLATION DETECTION CIRCUIT FOR USE IN AMI SIGNAL TRANSMISSION

Kuniharu Itoh, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 31, 1989, Ser. No. 359,307
Claims priority, application Japan, May 31, 1988, 63-132950
Int. Cl.[5] H04L *25/34*
U.S. Cl. 375—17 6 Claims



1. A circuit for detecting a code violation in an alternate mark inversion signal in which a first binary logic level is alternately expressed by a first polarity signal and a second polarity signal different from each other in polarity, and a second binary logic level complementary to the first binary logic level is expressed by a signal different in potential level from each of the first and second polarity signals, the code violation being realized by continuous occurrence of two same polarity signals without an intervening signal of the other polarity, comprising:

a first detecting circuit receiving the alternate mark inversion signal for generating a first detection signal at continuous occurrence of two first polarity signals without an intervening signal of the other polarity;

a second detecting circuit receiving the alternate mark inversion signal for generating a second detection signal at continuous occurrence of two second polarity signals without an intervening signal of the other polarity;

a first enable signal generating circuit receiving the first detection signal for generating a first enable signal having a predetermined active period;

a second enable signal generating circuit receiving the second detection signal for generating a second enable signal having a predetermined active period;

a first violation detection circuit receiving the second detection signal and the first enable signal for generating a first code violation detection signal when the second detection signal is generated during the active period of the first enable signal; and

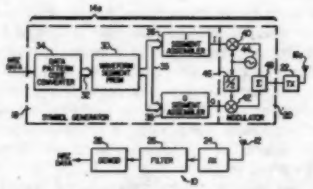
a second violation detection circuit receiving the first detection signal and the second enable signal for generating a second code violation detection signal when the first detection signal is generated during the active period of the second enable signal.

4,962,510

PHASE MODULATED SYSTEM WITH PHASE DOMAIN FILTERING

William T. McDavid, Richardson; William W. Bryce, and Talal A. Itani, both of Dallas, all of Tex., assignors to Terra Marine Engineering, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 852,200, Apr. 15, 1986, Pat. No. 4,745,628. This application May 13, 1988, Ser. No. 194,024
Int. Cl.[5] H04L *27/18*
U.S. Cl. 375—67 12 Claims



1. A phase modulation system for phase modulating a carrier with digital data, comprising:

means for receiving the digital data as a sequence of data bits at a predetermined bit rate;

a phase mapper circuit for converting the received digital data to discrete phase values in accordance with a predetermined phase modulation scheme;

phase domain filter means for cross-correlating a predetermined phase domain filter function with a predetermined number of discrete phase values about one current phase value, said one current phase value corresponding to one of said data bits, and said predetermined number of discrete phase values corresponding to a predetermined number of said data bits about one said data bit, said filter means outputting a filtered waveform in the phase domain of, said filtered waveform representing a continuous sequence in time of said discrete phase values; and

phase modulation circuitry for generating a carrier at a predetermined carrier frequency and phase modulating said carrier in accordance with said filtered waveform that is output by said phase domain filter means.

4,962,511

BARREL SHIFTER

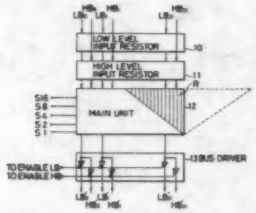
Takeji Tokumaru, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 17, 1989, Ser. No. 380,439

Claims priority, application Japan, Jul. 15, 1988, 63-175222

Int. Cl.[5] G06F *7/00*; H03K *17/00*

U.S. Cl. 377—69 **6 Claims**



1. A barrel shifter, comprising:

(a) a low-level-input resistor having a predetermined number of low-level-input-bit lines for setting data to be shifted;

(b) a high-level-input resistor having a predetermined number of high-level-input-bit lines for setting data to be shifted,

(c) the low-level-input resistor and the high-level-input resistor being arranged in parallel to each other such that the low-level-input-bit lines and high-level-input-bit lines are alternately arranged at predetermined intervals corresponding to the low-level-input resistor and the high level-input resistor respectively; and

(d) a barrel-shifter main unit for obtaining a shifted resultant,

(e) a wiring area in which wires from the high-level-input resistor are wired being incorporated in the barrel-shifter main unit as well as a wiring area from the low-level-input resistor such that the width of the input side of the barrel-shifter main unit are arranged to be substantially the same as the width of one of the low-level-input resistor and the high-level-input resistor.

4,962,512

STEP-UP CIRCUIT

Akihiro Kiuchi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

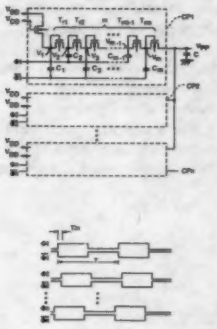
Filed Jun. 13, 1988, Ser. No. 206,221

Claims priority, application Japan, Jun. 26, 1987, 62-160681

Int. Cl.[5] H02M *3/07*; G11C *11/403*

U.S. Cl. 377—78 **4 Claims**

1. In a step-up circuit with charge pumping means for generating an output voltage higher than a power source voltage, the improvement wherein said step-up circuit comprises a plurality of charge pumping means connected in parallel to an output line and said charge pumping means are activated by pairs of mutually opposite clock signals individually applied thereto, said pairs of clock signals are phase displaced with



respect to other pairs of clock signals, whereby said output voltage is supplied more stably against fluctuations.

4,962,513

COMPUTER TOMOGRAPHY APPARATUS WHICH AVOIDS IMAGE ARTIFACTS CAUSED BY PERIODICAL VOLTAGE VARIATIONS

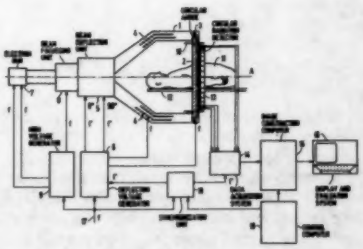
Guenter Schwierz, Neunkirchen, and Joachim Kestler, Pinzberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 2, 1989, Ser. No. 430,369

Claims priority, application European Pat. Off., Nov. 22, 1988, 88119417.9

Int. Cl.[5] A61B *6/00*; H01J *35/14*

U.S. Cl. 378—12 **6 Claims**



1. A computer tomography apparatus comprising:

an x-radiator including means for generating a focussed electron beam, a circular anode on which said focussed electron beam is incident at a focus so as to produce a fan-shaped x-ray beam, said circular anode having a central opening defining an examination aperture, and an electron beam deflection means for moving said focus around said circular anode in a plurality of revolutions so that said x-ray beam irradiates said examination aperture from a plurality of different angular directions so as to irradiate a slice of an examination subject, said electron beam deflection means being supplied with a line voltage having a ripple of known periodicity;

means adapted for supporting said examination subject in said examination aperture;

detector means, consisting of a plurality of sideside detector elements arranged in a circle surrounding said examination aperture, for detecting x-radiation attenuated by said examination subject and generating electrical signals corresponding to the detected radiation;

data acquisition means connected to said detector means for reading out said electrical signals from each of said detector elements;

means connected to said data acquisition means for constructing an image of said irradiated slice of said examination subject from said electrical signals; and

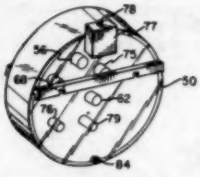
synchronization means connected to said electron beam deflection means and to said data acquisition system for, for each revolution of said focus on said circular anode, phase-shifting the focus movement and the read-out of said detector elements, compared to a preceding revolution of said focus, relative to the ripple period of said line voltage.

4,962,514

METHOD OF CALIBRATING A TOMOGRAPHIC SYSTEM FOR TESTING EARTHEN CORES

Timothy J. Hart, and Lorne A. Davis, Jr., both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 21, 1988, Ser. No. 273,541
Int. Cl.[5] G01N *23/00*; G01D *18/00*
U.S. Cl. 378—18 **5 Claims**



1. A method of calibrating a tomographic system for earthen core testing comprising the steps of:

calibrating the tomographic system with a plurality of a B type phantom means for contrast resolution, and

calibrating the tomographic system with a plurality of A type phantom means for beam hardening correction; and

in which each A type phantom means contains only one earthen sample, and

the contrast resolution calibrating step includes:

providing the phantom means in a manner so that each B type phantom means contains a plurality of different earthen samples,

locating the plurality of earthen samples in each B type phantom means so that there is space in the B type phantom means between the earthen samples,

operating the tomographic system while the medium between the earthen samples within the B type phantom means is air so as to obtain data,

operating the tomographic system with the B type phantom means while having water as the medium between the earthen samples so as to obtain data,

operating the tomographic system while the medium between the earth samples within the B type phantom means is liquid Freon so as to obtain data, and

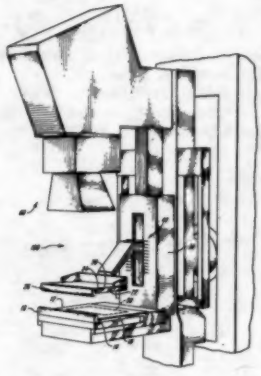
calibrating the tomographic system in accordance with the data accumulated from the operation of the tomographic system with each of the B type phantom means containing air, water, and Freon.

4,962,515

RIDGED COMPRESSION ASSEMBLY FOR MAMMOGRAPHY APPARATUS

Daniel B. Kopans, Waban, Mass., assignor to The General Hospital Corporation, Boston, Mass.

Filed Nov. 13, 1989, Ser. No. 435,613
Int. Cl.[5] A61B *6/04*
U.S. Cl. 378—37 **18 Claims**



12. A breast compression plate for a mammography apparatus, comprising:

a compression member having a compression surface extending from an input edge thereto; and

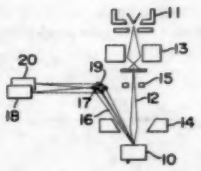
a ridge member extending from said input edge and beyond said compression surface at least partially in the direction substantially perpendicular to said compression surface at said input edge.

4,962,516

METHOD AND APPARATUS FOR STATE ANALYSIS

Hiroyoshi Soezima, Kyoto, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Continuation of Ser. No. 747,423, Jun. 21, 1985, abandoned. This application Jan. 27, 1989, Ser. No. 302,148
Int. Cl.[5] G01N *23/223*
U.S. Cl. 378—45 **13 Claims**



1. A method for analyzing the chemical bonding state of an element in a specimen, comprising the steps of:

applying a beam of X-rays or electrons from a source to at least one measurement point of the specimen including said element;

detecting signals of the intensity of the characteristic X-rays generated and emitted from said measurement point at two selected different wavelengths within the spectrum of the characteristic X-rays generated by said element in a first bonding state, said wavelengths being selected to provide a change in intensity ratio for different chemical bonding states of the element being analyzed as compared

to the intensity ratio of the element in the first bonding state;

multiplying one of the respective signals of energy intensity by a factor related to a change in spectral shape of characteristic X-ray spectrum detected for said element in the respective bonding states in order to obtain a product;

comparing the product with the other of said detected signals of intensity at said measurement point and determining the ratio thereof; and

generating output signals corresponding to a chemical bonding state when the product to intensity ratio falls within a predetermined range of ratio values which is indicative of a known chemical bonding state.

4,962,517

AUTOMATIC X-RAY CORRECTION DEVICE

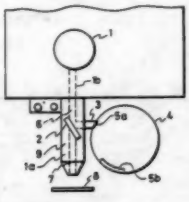
Toshiyuki Koga, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan

Continuation of Ser. No. 500,251, Jun. 2, 1983, abandoned, and Ser. No. 533,543, Sep. 17, 1983, abandoned. This application Sep. 25, 1985, Ser. No. 780,966

Claims priority, application Japan, Jun. 3, 1982, 57-82823; Sep. 24, 1982, 57-166269

Int. Cl.[5] G01N *23/223*

U.S. Cl. 378—48 **15 Claims**



1. An X-ray device comprising: an X-ray tube for generating X-rays; a collimator for collimating the X-rays from said X-ray tube and directing the X-rays to a sample to thereby cause the sample to emit fluorescent X-rays; a movable shutter having said collimator attached thereto for movement therewith and disposed between said X-ray tube 1 and the sample for movement between an opening position for permitting the X-rays to be directed to the sample and a close position for preventing the X-rays from being directed to the sample; an X-ray detector for detecting the fluorescent X-rays emitted from the sample when said shutter is in the open position; a correction standard plate movable with the shutter for receiving X-rays from said X-ray tube and for emitting and directing fluorescent X-rays onto said X-ray detector only when said shutter is in the closed position; and correction means connected to said X-ray detector for automatically correcting for irregularities of the X-ray intensity and wave height when said shutter is in the closed position.

4,962,518

APPARATUS FOR MEASURING THE THICKNESS OF A COATING

Jerry J. Spongr, and Byron E. Sawyer, both of Tonawanda, N.Y., assignors to Twin City International, Inc., Tonawanda, N.Y.

Continuation-in-part of Ser. No. 129,477, Dec. 7, 1987, abandoned. This application Aug. 23, 1988, Ser. No. 235,946

Int. Cl.[5] G01B *15/02*

U.S. Cl. 378—50 **10 Claims**

1. An improved apparatus for measuring the thickness of a coating on the surface of a workpiece; the improved apparatus:

a frame (12);

an X-ray tube (14) mounted on the frame;

a work holder (34) for holding a workpiece (36);

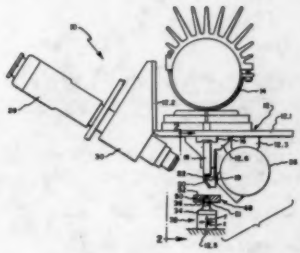
a mirror (20) mounted on the frame, the radiation from the X-ray tube being projected through the mirror to a coating on the surface of a workpiece during the measurement of the coating;

first collimator means (19) mounted on the frame between the X-ray tube and the mirror;

a fixed focal length viewing device (29) mounted on the frame through which the coating may be viewed, the view of the coating being reflected to the viewing device by the mirror;

work holder mounting means mounted on the frame and capable of moving the work holder and the associated workpiece in such a manner that the coating which is to be measured may be moved into position where it can be viewed through the viewing device in sharp focus, the coating when in sharp focus being a predetermined distance away from the X-ray tube; and

signal detector means (26) mounted on the frame;



wherein the improvement comprises second collimator means (48), and moving means (53) mounted on the frame and capable of moving the second collimator means between operative and inoperative positions, the second collimator means including a second collimator (50) movable between operative and inoperative positions and being between the mirror and the workpiece when in the operative position, the terminal end (51) of the second collimator being disposed as close as possible to the coating to be measured when in an operative position so that the X-ray beam which contacts the coating will not spread beyond the sides of the area of the coating to be measured, and wherein the coating may be viewed through the viewing device when the second collimator is in an inoperative position.

4,962,519

LUBRICATED BEARING RETAINER FOR X-RAY TUBE

Kamleshwar Upadhya, Glendale, Wis., assignor to General Electric Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 331,508, Mar. 31, 1989, Pat. No. 4,914,684. This application Jan. 22, 1990, Ser. No. 468,376

Int. Cl.[5] H01J *35/10*

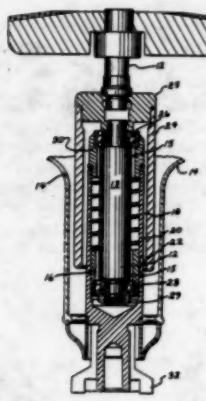
U.S. Cl. 378—133 **6 Claims**

1. In an X-ray tube having a hollow anode stem having an inner surface and containing an anode shaft supported by one or more bearings having inner and outer races, a bearing retainer comprising:

a retainer substrate means for slidably fitting coaxially within the hollow anode stem;

a bearing sleeve means coaxially affixed to the retainer sub-

strate for holding an outer race of a bearing fixedly and coaxially with respect to the retainer substrate;



a solid lubricant applied to the outer circumference of the retainer substrate for lubricating the sliding of the retainer means.

4,962,520

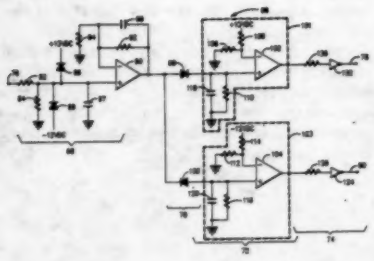
COMPOSITE RINGING AND COIN CONTROL VOLTAGE DETECTOR AND METHOD

Yuksel Gozen, Istanbul, Turkey, assignor to Alcatel NA, Inc., Hickory, N.C.

Filed Dec. 8, 1989, Ser. No. 448,069

Int. Cl.[5] H04M *3/02, 17/02, 19/02*

U.S. Cl. 379—29 **31 Claims**



1. A composite detection circuit for use in the loop testing of a telephone system for detecting ringing voltages and coin control voltages on a telephone line, said circuit comprising:

an input terminal for connection to a telephone line for receiving an input voltage therefrom;

means connected to said input terminal for conditioning said input voltage, said conditioning means having an output for providing a conditioned voltage;

means for separating said conditioned voltage into positive and negative portions, said separating means having an input connected to said output of said conditioning means and positive and negative outputs for providing positive and negative portions of said conditioned voltage; and

means for detecting when said positive and negative portions of said conditioned voltages exceed predetermined thresholds and for providing output voltages indicative thereof, whereby a voltage indicative of a positive voltage corresponds to a detected positive ringing or coin control voltage and a voltage indicative of a negative voltage corresponds to a detected negative ringing or coin control voltage, said detecting means having inputs connected to the outputs of said polarity separating means and first and second outputs for providing said indicative voltages.

4,962,521

APPARATUS FOR STILL PICTURE VIDEO TELEPHONE APPARATUS AND METHODS FOR TRANSMITTING AND DISPLAYING STILL PICTURE IMAGE FOR USE THEREIN

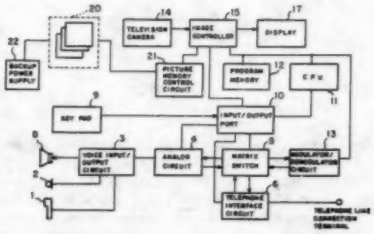
Fumiaki Komatsu; Junichi Sakamoto; Hitoshi Fujimoto; Hiroshi Ohtsuka; Kazuyuki Saiguss; Akifumi Kabasawa, all of Kanagawa; Shinya Yokodate, Gumma, and Kenichi Kashiwagi, Kanagawa, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 16, 1988, Ser. No. 285,816

Claims priority, application Japan, Dec. 17, 1987, 62-319725; Apr. 22, 1988, 63-99804; Apr. 22, 1988, 63-99805; Apr. 22, 1988, 63-99806

Int. Cl.[5] H04M *11/00*; H04N *7/14*

U.S. Cl. 379—53 **10 Claims**



1. A still picture video telephone apparatus adapted to transmit and to receive, through a telephone line, still picture information delivered from a television camera or the like during a telephone call, comprising:

a picture memory for storing a plurality of pages of picture information consisting of a camera-taken picture memory portion which writes still picture information input thereto from said television camera at intervals of a predetermined period, a self-prepared picture memory portion which stores desired still picture information from said camera-taken picture memory portion, and an incoming picture memory portion storing a plurality of pages of incoming picture information in respective storage regions and which sequentially rewrites still picture information therein upon receipt of still picture information when said storage regions are full;

memory region information input means for setting up regions of said self-prepared picture memory portion and said incoming picture memory portion within said picture memory; and

picture memory control means for controlling still picture information input to and output from said picture memory;

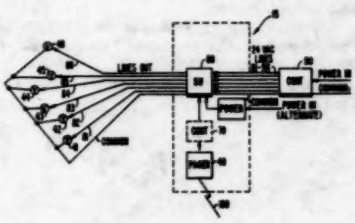
wherein said picture memory is capable of storing a plurality of pages of still picture information, and allocation of memory regions within the picture memory for said self-prepared picture memory portion and said incoming picture memory portion is variable.

4,962,522

ELECTRONIC CONTROLLER FOR SPRINKLER SYSTEMS

Michael B. Marian, 152 Bahama Reef, Novato, Calif. 94946

Filed Dec. 4, 1987, Ser. No. 129,128
Int. Cl.[5] A01G 27/00
U.S. Cl. 379—5 9 Claims



1. A process of controlling a sprinkler system having connection for controlled irrigation and being within the service area of an existing telephone paging network;

said existing telephone paging network consisting of telephones connected via telephone lines to a paging station, said paging station having the capability of transmitting addressing and messaging signals to individual pager subscribers via a discrete radio digital signal upon request of a caller from one of said telephones;

said sprinkler system having at least one sprinkler, water supply and valve means located in a conduit between said water supply and said sprinkler for the controlled flow of water from said water supply through said valve means and to said sprinkler for controlled irrigation;

said sprinkler system including at least one sprinkler controller, said sprinkler controller including means for operating said valve means on said sprinkler system, an input for sprinkler control digital information, and means for translating said sprinkler control digital information into operation of said valve means;

said sprinkler system including at least one of said pagers, said controlling process comprising the steps of:

calling said existing telephone paging network from one of said telephones through one of said telephone lines to provide addressing and messaging signals to said network;

after said calling step, transmitting said addressing and messaging signals from said telephone paging network to said pager;

communicating from said pager to said sprinkler controller upon receipt of said addressing and messaging signal, sprinkler control digital information for controlling the flow of water through said sprinkler.

4,962,523

RADIO TELEPHONE SET USED AS PORTABLE SET AND VEHICLE-MOUNTED SET

Mituru Tanaka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 30, 1989, Ser. No. 302,900
Claims priority, application Japan, Jan. 29, 1988, 63-16935
Int. Cl.[5] H04M 1/02; H04B 7/00
U.S. Cl. 379—58 19 Claims

1. A radio telephone set which is to be used as a portable set and a set mounted on a vehicle with a vehicle battery, comprising:

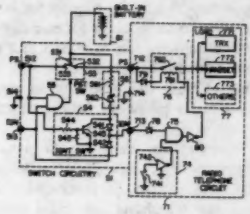
radio telephone circuit means including a load and first and second terminals, said load being provided with power through said first terminal;

battery means for powering said radio telephone set when used as a portable set;

third and fourth terminals for said vehicle battery, said fourth terminal being connected to said vehicle battery through an engine key circuit of said vehicle;

first switching means connected to said first and third terminals and to said battery means for connecting said first terminal to said battery means in response to a first control signal and for switching the connection of said first terminal from said battery means to said third terminal in response to a second control signal;

first gate means having two inputs connected to said third and fourth terminals, respectively, for providing said first control signal when either one or both of the voltages at said two inputs is low and for providing said second control signal when both the voltages at said two inputs are high; and



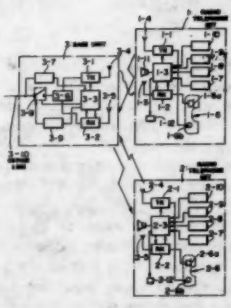
second switching means connected to said second through fourth terminals and to said battery means for connecting said second terminal to said battery means when a voltage at said third terminal is low and for switching the connection of said second terminal from said battery means to said fourth terminal when the voltage at said third terminal is high.

4,962,524

CORDLESS TELEPHONE APPARATUS AND A METHOD OF CONTROLLING SAME

Yoshitoshi Murata, Yokohama; Yuji Ohta, Saita; Akio Yotsutani; Toshihiro Hara, both of Tokyo; Koji Ono, and Shoji Fuse, both of Hachioji, all of Japan, assignors to Nippon Telegraph and Telephone Corporation; NEC Corporation, both of Tokyo and Kabushiki Kaisha Toshiba, Kawasaki, all of, Japan

Filed Jun. 2, 1988, Ser. No. 201,204
Claims priority, application Japan, Jun. 3, 1987, 62-139455
Int. Cl.[5] H04Q 7/04
U.S. Cl. 379—61 18 Claims



1. A cordless telephone apparatus coupled to a telephone network via a local telephone line, comprising:

a base unit connected to the local line;

a plurality of radio telephone sets coupled to the base unit;

means for forming a communication channel for facilitating

telephone communication between one of the plurality of radio telephone sets and a remote telephone set on the network via the local line by establishing a radio circuit between the base unit and said one of the plurality of radio telephone sets;

means for generating a request for hold from said one of the radio telephone sets to the base unit to temporarily suspend the telephone communication between said one radio telephone set and the remote set and for generating a request for transfer to a receiving one of the radio telephone sets from the transferring radio telephone set to the base unit in response to the request for hold;

means responsive to the request for transfer for establishing a radio circuit among the base unit and the transferring and receiving radio telephone sets, and for delivering a ringing signal from the base unit to the receiving and transferring radio telephone sets simultaneously via the radio circuit; and

means for releasing the temporary suspension of the telephone communication, inhibiting the delivery of the ringing signal, and forming a communication channel for facilitating the telephone communication between the remote set and at least one of the transferring and receiving radio telephone sets when said at least one of the transferring and receiving radio telephone sets responds to the ringing signal.

4,962,525

METHOD FOR THE USE OF A TELEPHONE SYSTEM WITH COMMON SIGNALING CHANNEL FOR THE CASTING OF VOTES

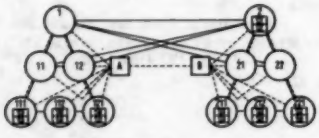
Horst Beckh, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 25, 1989, Ser. No. 343,454

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1988, 3814064

Int. Cl.[5] H04M *11/00, 1/64*

U.S. Cl. 379—92 **3 Claims**



1. A method for the use of a telephone switching system with a common signalling channel for the casting of votes from callers by dialing a particular vote subscriber number of a destination switching center corresponding to a particular vote, comprising the steps of:

providing a common signalling channel between a plurality of source switching centers and the destination switching center;

answering and counting votes cast by callers at each of said plurality of source switching centers for incoming calls which correspond to the particular vote subscriber number dialed, and inhibiting the connection of the incoming calls to the destination switching center;

summing the vote count of each of said plurality of source switching centers and periodically transferring a sum value of the vote count to the destination switching center using the common signalling channel; and

adding the sum values from the source switching centers at the destination switching center.

4,962,526

IMAGE DATA TRANSMISSION APPARATUS

Matahira Kotani, Ikoma; Masafumi Matsumoto, Takaichi; Mamoru Fujii, Nara; Motohiko Hayasai, Yamatokoriyama; Masayuki Hachinoda, Nara; Mitsunobu Kondo, Yokohama; Naomitsu Murata, Nagoya, and Kouichi Mino, Higashikodaira, all of Japan, assignors to Nippon Telegraph, Tokyo and Telephone Corporation & Sharp Kabushiki Kaisha, Osaka, both of, Japan

Filed Mar. 15, 1989, Ser. No. 323,852

Claims priority, application Japan, Mar. 15, 1988, 63-62662; Mar. 15, 1988, 63-62663

Int. Cl.[5] H04M *11/00, 1/32;* H04N *1/028, 1/32*

U.S. Cl. 379—100 **10 Claims**

1. An image data transmission apparatus for transmitting image data of an original being read by a reading unit, detachably connected to the transmission apparatus main body, the image reading unit comprising:

rotary roller means for rotating in contact with the original from which the image data is to be read,

means for detecting the relative moving state of the image reading unit and the original in response to said rotary roller means, and sending out signals at every predetermined angular dislocation amount of the rotary roller means, and

optical reading means for reading said image data from the original; and

the transmission apparatus main body comprising,

original conveying means for conveying an original past the image reading unit when the image reading unit is in a state mounted to said transmission apparatus main body,

means for transmitting and receiving image data,

means for detecting a presence or absence of a mounting state of the image reading unit on the main body, and

means for stopping the original conveying means when the absence of the mounting state of the image reading unit is detected by the detecting means.

4,962,527

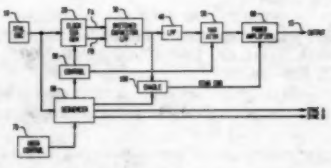
SERIES RINGING SIGNAL GENERATOR

Robert V. Burns, and Sanjay Gupta, both of Phoenix, Ariz., assignors to Siemens Transmission Systems, Inc., Phoenix, Ariz.

Filed May 22, 1989, Ser. No. 355,221

Int. Cl.[5] H04M *3/02*

U.S. Cl. 379—418 **3 Claims**



1. A series ringing signal generator comprises:

a source of a user control signal;

a programmable ringing signal generator for generating an

analog sine wave having a selectable frequency and amplitude in response to a selection signal;

sequencing means, coupled between said source of a user control signal and said programmable ringing signal generator, for repetitively generating a selectable one of a set of sequences of selection signals in response to said user control signal;

a source of a clock signal;

a controlled clock signal generator, having a clock input terminal coupled to said source of a clock signal, a control input terminal, and first and second output terminals;

a switched capacitor low pass filter, having first and second input terminals coupled to said first and second output terminals of said controlled clock signal generator, respectively, and an output terminal;

an analog low pass filter, having an input terminal coupled to said output terminal of said switched capacitor LPF, and an output terminal;

a variable attenuator, having a signal input terminal coupled to said analog LPF, a control input terminal, and an output terminal;

a power amplifier, having a signal input terminal coupled to said output terminal of said variable attenuator, and an output terminal for producing said analog sine wave; and

a control signal generator having an input terminal coupled to said sequencing means, and first and second output terminals coupled to said control input terminals of said controlled clock signal generator and said variable attenuator, respectively.

4,962,528

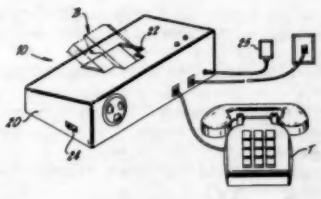
BEEPER AMPLIFIER

Juan H. Herrera, 332 SW. 6 St., Miami, Fla. 33130

Filed May 22, 1989, Ser. No. 355,226

Int. Cl.[5] H04M 1/72

U.S. Cl. 379—442 **6 Claims**



1. An amplifier for portable paging devices producing an audible signal when activated and selectively connected with the tip and ring lines of a telephone set including a bell for connection to the public network, comprising:

A. housing means for receiving at least one of said paging devices and further including means for detecting the presence of at least one of said devices;

B. electrical amplifier means for picking up and amplifying said audible signal and producing an amplified output voltage;

C. means for supplying a voltage signal capable of driving said bell, having an input connected to said amplified output voltage and further having a voltage signal output connected to the tip and ring lines of said telephone set so that said voltage signal drives said bell in response to the application of said amplified output voltage at the input of said means for supplying a voltage signal which in turn is generated only when an audible signal is emitted by said paging device.

4,962,529

SCRAMBLING METHOD FOR TV PICTURE

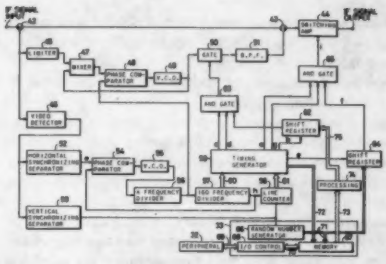
Yoshifumi Saeki, and Shigeru Watanabe, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 510,139, Jul. 1, 1983, abandoned. This application May 23, 1986, Ser. No. 870,297

Claims priority, application Japan, Jul. 4, 1982, 57-114237

Int. Cl.[5] H04N 7/167

U.S. Cl. 380—15 **10 Claims**



1. A method of scrambling video signals of the type wherein each line of said video signal includes a horizontal flyback portion containing a horizontal synchronizing signal and an image portion containing video information to be displayed, said method comprising:

(A) intermittently compressing to a prescribed quantity, in synchronism with the timing of a horizontal synchronizing signal of a TV video signal, only said flyback line section to a level well below the maximum percentage modulation of the video signal portion of the TV video signal while leaving said image portion unchanged;

(B) overlapping key signals defining information regarding said intermittent compression of said prescribed quantity onto the horizontal synchronizing signal of the TV video signal; and

(C) prior to said intermittently compressing step, overlapping address signals indicating whether or not terminal equipment may receive pictures, onto the horizontal synchronizing signal of the TV video signal, to thereby form a scrambled video signal including successive lines having intermittently compressed horizontal flyback sections and unchanged image portions.

4,962,530

SYSTEM FOR CRYPTOGRAPHING AND IDENTIFICATION

John P. Cairns, Wilmington, Del., assignor to Computer Security Corporation, Wilmington, Del.

Filed Sep. 10, 1987, Ser. No. 95,405

Int. Cl.[5] G06F 3/02

U.S. Cl. 380—23 **11 Claims**

1. A security apparatus for identification of a preselected code of characters by a predetermined cryptogram of symbols comprising in combination:

a matrix consisting of an arrangement of a plurality of locations having selectively operable manual switches and variable visible indicia associated with said switches, said indicia operative to display letters and numerals at said locations,

said switches being sequentially actuatable with a sequence of values representing a preselected code of symbols consisting of alphanumeric characters and matrix coefficients,

a matrix coefficient consisting of a value represented by a visible indicia at a selected location at a selected sequence in said preselected code,

a first memory containing a configuration of alphanumeric

characters and matrix coefficients for display on said variable visible indicia,

a predetermined program of a preselected code of symbols consisting of alphanumeric characters in binary coded decimals and matrix coefficient in said first memory having potential levels at addresses,

means for providing pulses to said addresses in said first memory upon the operation of a switch

means for transmitting the potential levels of said binary coded decimals from said first memory to said plurality of latches,

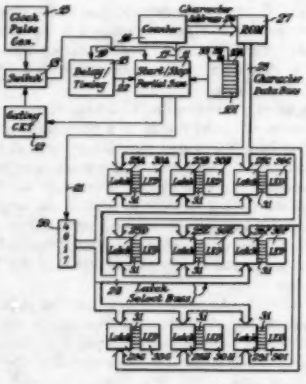
means for storing said binary coded decimals in said latches whereby each transmitted binary coded decimal is stored in a latch,

means upon operation of said switch for generating a pulse to a delay timing circuit,

means for transmitting a delayed signal from said delay timing circuit to produce a timed sequence of signals selected to be transmitted to said selected latches subsequent to the storage of the binary coded decimals in said latches,

transmitting the stored binary decimals in each of said latches to a decoding circuit and to a sending circuit,

means associated with said first memory for displaying on



said variable visible indicia upon actuation of said switches of a plurality of said symbols including at least one alphanumeric character and at least one matrix coefficient in said actuated code of symbols,

means electrically connecting one of said manual switches to said sending circuit for providing a signal to said sending circuit upon operation of said manual switch,

means for depositing the binary coded decimal from said sending circuit on an electrical connection to a microprocessor upon transmission of said signal from said manual switch,

said microprocessor having a second memory accessed by the microprocessor, said microprocessor being operative for executing a program stored in said second memory,

means for storing in said second memory at least one access code of a preselected code of symbols consisting of at least one alphanumeric character and at least one matrix coefficient,

operative to sequentially enter to said microprocessor pulses defining said actuated code of symbols,

said microprocessor having means for comparing the binary coded decimal produced by the operation of the sending circuit with the stored access code,

and means providing a signal when the transmitted binary coded decimal is not equal the stored access code.

4,962,531

TRANSACTION SYSTEM COMPRISING ONE OR MORE HOST EXCHANGES AND A NUMBER OF DISTRIBUTED TERMINAL STATIONS

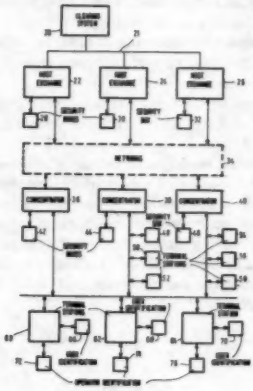
Wilhelmus H. M. Sipman, and Lambertus Snel, both of The Hague, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 26, 1988, Ser. No. 237,342

Claims priority, application Netherlands, Aug. 28, 1987, 8702012

Int. Cl.[5] H04L 9/00

U.S. Cl. 380—24 **17 Claims**



1. A transaction system comprising:

(a) at least one host exchange;

(b) a network;

(c) a plurality of concentrators, coupled with the at least one host exchange via the network, each concentrator comprising:

(i) protocol means for executing protocolled data transports with at least one host exchange; and

(ii) cryptography means for performing cryptographic operations on and exchanging:

(A) user transaction requests; and

(B) request response information; with said at least one host exchange;

(d) a first number of distributed terminal stations, respective subsets of the plurality of terminal stations each being associated with a respective one of the concentrators, each terminal station comprising

(i) a respective first presentation location for receiving a portable user identification element; and

(ii) respective bidirectional communication elements for

(A) receiving a respective user transaction request from a user, subject to receipt and verification of the user identification element,

(B) transmitting the respective transaction request to the respective one of the concentrators,

(C) receiving respective request response information from the respective one of the concentrators, and

(D) transmitting the respective request response information to the user; and

(e) at least one second presentation location, associated with at least one respective terminal station but physically separate from the respective at least one first presentation location, for receiving a portable operator identification element containing data processing elements and key information for a so-called public algorithm, so that the at

least one terminal station uses the data processing elements and the key information for

(i) performing encryption operations with respect to the respective user transaction request prior to transmitting the respective user transaction request; and

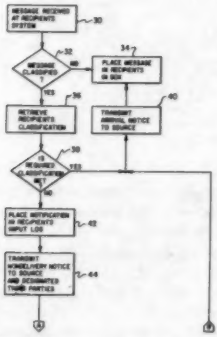
(ii) performing decryption operations with respect to the respective request response information after receiving the respective request response information.

4,962,532

METHOD FOR PROVIDING NOTIFICATION OF CLASSIFIED ELECTRONIC MESSAGE DELIVERY RESTRICTION

Chander Kasiraj, Grapevine, and Timothy J. Wolf, Bedford, both of Tex., assignors to IBM Corporation, Armonk, N.Y.

Filed Dec. 22, 1988, Ser. No. 288,520
Int. Cl.[5] H04L 9/00
U.S. Cl. 380—25 **8 Claims**



1. A method for notifying the source of a classified electronic message transmitted via a computer network of a delivery restriction imposed by the classification level of the recipient, comprising the steps of:

transmitting a required classification level in association with an electronic message to a selected recipient via a computer network;

comparing said transmitted required classification level with the classification level of said selected recipient;

automatically restricting delivery of said electronic message to said selected recipient in response to the failure of said classification level of said selected recipient to meet or exceed said transmitted required classification level; and

automatically transmitting the status of said delivery to said source.

4,962,533

DATA PROTECTION FOR COMPUTER SYSTEMS

Steven D. Krueger, Houston, Tex.; Martha A. Branstad, Gaithersburg, and Stephen T. Walker, Glenwood, both of Md., assignors to Texas Instrument Incorporated, Dallas, Tex.

Filed Feb. 17, 1989, Ser. No. 312,142
Int. Cl.[5] H04L 9/00
U.S. Cl. 380—25 **4 Claims**

1. A computer system, comprising:

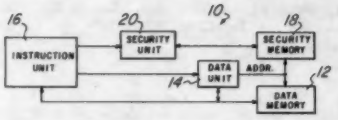
an instruction unit;

a data memory;

a data unit coupled to said instruction unit, wherein said instruction unit reads instructions from said data memory, and causes said data unit to perform arithmetical and logical functions on data taken from said data memory;

a security memory in parallel with said data memory, wherein said security memory contains a security label for each location in said data memory; and

a security unit, wherein said security unit, for each instruction performed in said data unit, compares the security



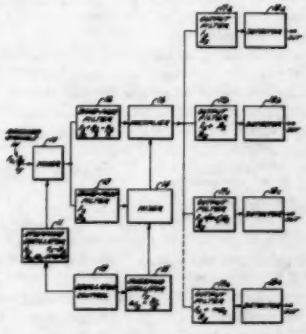
level for all data used by the instruction with a clearance level for a user, and which assigns to every modified memory location a security level which dominates the levels of all data used to determine the modified value of such memory location.

4,962,534

FREQUENCY-DIVERSITY RECEIVER SYSTEM

Richard L. Taylor, Bladensburg; Ralph D. Drosd, deceased, late of Kensington, and by Luther W. Gregory, administrator, Arnold, all of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 4, 1967, Ser. No. 607,607
Int. Cl.[5] H04K 1/10; H03D 7/16
U.S. Cl. 380—34 **4 Claims**



1. A frequency diversity receiver system operating over a predetermined bandwidth comprising a first mixer receiving two identical information signals widely separated in frequency, a stepping oscillator with a predetermined number of steps controlling the output frequency of said mixer, two frequency channels at the output of said mixer, the first of said channels having a broad bandwidth filter and the second having a narrow bandwidth filter, a second mixer receiving simultaneously the output of said second filter and the output signal of a sweeping oscillator, said sweeping oscillator having a preselected sweep, means to synchronize said sweeping oscillator and said stepping oscillator, a multiplier simultaneously receiving the output signals from said first filter and said second mixer, a bank of parallel filters and associated detectors receiving the output signals from said multiplier, each of said filters of said bank having a predetermined bandwidth.

4,962,535
VOICE RECOGNITION SYSTEM

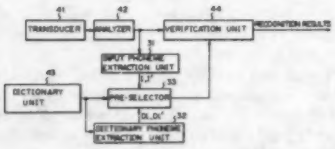
Shinta Kimura, and Toru Sanada, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 165,842, Mar. 9, 1988, abandoned. This application Jan. 12, 1990, Ser. No. 464,594

Claims priority, application Japan, Mar. 10, 1987, 62-053066

Int. Cl.[5] G10L *5/00*

U.S. Cl. 381—43 **3 Claims**



1. A voice recognition system for selecting word templates necessary for voice recognition from among a plurality of word templates, comprising:

an input phoneme extraction unit for extracting distinctive phonemes which can be clearly recognized from an input pattern of a voice and for extracting all phonemes possibly existing in the input pattern, said input phoneme extraction unit generates first bit expression values of the distinctive phonemes which can be clearly recognized from the input pattern, and generates second bit expression values of all phonemes possibly existing in the input pattern;

a dictionary phoneme extraction unit for extracting the distinctive phonemes which are clearly recognized and can be previously determined at each word template and for extracting all phonemes possibly existing at each word template, said dictionary phoneme extraction unit generates third bit expression values of the distinctive phonemes which can be clearly recognized and can be previously determined at each word template, and generates fourth bit expression values of all phonemes possibly existing in each word template;

a pre-selector, coupled between said input phoneme extracting unit and said dictionary phoneme extracting unit, for selecting valid word templates for performing voice recognition based on phoneme information extracted by said input phoneme extraction unit and said dictionary phoneme extraction unit, said preselector selects valid word templates by employing the following formula:

$$|(D_f \cdot I') \oplus I' \cdot (D_f \cdot I) \oplus D|$$

wherein D_f is the fourth bit expression value, D_f is the third bit expression value, I is the second bit expression value, I' is the first bit expresion value, i is the number of the word template, and $\oplus$ denotes an exclusive OR operation, said preselector also determining whether or not all bits of the above formula indicate the value "1"; and

a bit expression memory, coupled between said dictionary phoneme extraction unit and said pre-selector, for storing the third and fourth bit expression values previously calculated by said dictionary phoneme extraction unit.

4,962,536
MULTI-PULSE VOICE ENCODER WITH PITCH PREDICTION IN A CROSS-CORRELATION DOMAIN

Yayoi Satoh, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

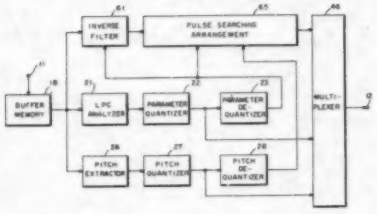
Filed Mar. 28, 1989, Ser. No. 329,832

Claims priority, application Japan, Mar. 28, 1988, 63-71805

Int. Cl.[5] G10L *5/00*

U.S. Cl. 381—49 **3 Claims**

1. In a voice encoder having an encoder input terminal supplied with an input voice signal and an intermediate terminal to which an excitation pulse signal is delivered to represent said input voice signal, said voice encoder comprising analyzing means for analyzing said input voice signal into feature parameters to produce a feature parameter signal representative of said feature parameters, extracting means connected to said input terminal for extracting pitch periods from said input voice signal to produce a pitch period signal representative of said pitch periods, residual signal producing means connected to said input terminal and controlled by said feature parameter signal for producing a prediction residual signal related to said input voice signal, and pulse searching means connected to said intermediate terminal and supplied with said feature parameter signal, said pitch period signal, and said prediction residual signal for searching excitation pulses representative of said input voice signal in each of pulse search durations successively determined with reference to said pitch periods, said



pulse searching means thereby producing the excitation pulses in said pitch periods to deliver said excitation pulse signal to said intermediate terminal, the improvement wherein said pulse searching means comprises:

local signal producing means connected to said intermediate terminal and to said residual signal producing means and controlled by said feature parameter signal and said pitch period signal for producing a local signal related to said prediction residual signal in each of said pulse search durations; and

a pulse searching circuit connected to said intermediate terminal and supplied with said feature parameter signal, said pitch period signal, and said local signal for searching said excitation pulses in said pulse search durations to deliver said excitation pulse signal to said intermediate terminal.

4,962,537
SHAPE ADAPTABLE IN-THE-EAR HEARING AID

Rainer Basel, and Helmut Lebisch, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 16, 1988, Ser. No. 245,648

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1987, 8712957[U]

Int. Cl.[5] H04R *25/00*

U.S. Cl. 381—68.6 **8 Claims**

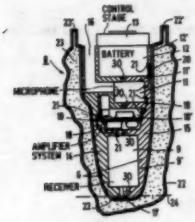
1. A hearing aid to be worn to least partially in the auditory canal of a user, said hearing aid comprising:

a plurality of electrical components connected together with flexible electrical lines;

a pliable member in which said electrical components and lines are embedded, said pliable member having a size smaller than said auditory canal permitting said components to be roughly positioned to conform to the shape of said auditory canal;

said pliable member consisting of first and second joined halves, said first half having a plurality of recesses therein respectively conforming to the shape of said electrical

components, and said second half forming a cover for said first half; and



a hardened otoplastic material surrounding said pliable member and filling the volume between said pliable member and the wall of auditory canal.

4,962,538

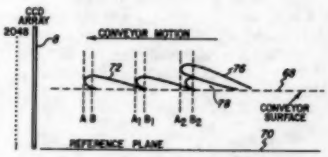
IMAGE ANALYSIS COUNTING SYSTEM

Susan G. Eppler, Garland, and Robert M. Moorehead, Richardson, both of Tex., assignors to Comsr, Inc., Richardson, Tex.

Continuation-in-part of Ser. No. 309,243, Feb. 13, 1989. This application Jun. 7, 1989, Ser. No. 348,710

Int. Cl.[5] G06K 9/00

U.S. Cl. 382—1 **5 Claims**



1. A system for obtaining a count of overlapped newspapers carried on a moving conveyor comprising:

first means for optically focusing the side image of the newspapers on a transversely oriented linear detector array;

second means for serially shifting analog outputs at a clock defined rate from said detector array to differential amplifier means for removing the DC offset therefrom;

third means receiving the output from said differential amplifier means and for converting said differential amplifier means output to a serial digital output signal as defined by a selected light level,

a serial-in/parallel-out shift register receiving said third means output signal,

a microprocessing means for developing an image top profile value of the newspaper flow image as it appears in said photodetector array based upon the output of said shift register; means for comparing the difference between successive newspaper image top profile values to obtain a derivative of successive image top profile values;

means for initiating a newspaper count output when the rate of change of successive image top profile values change from positive to negative; and

means to develop a newspaper thickness definite value, said newspaper count output comprises a single count increment when said newspaper thickness definitive value exceeds a calibrated thickness value and said newspaper count output comprises a double count increment when said measured newspaper thickness exceeds a second calibrated thickness value.

4,962,539

METHOD OF RECOGNIZING LAYOUT AND SUBDIVISION PATTERNS OF RADIATION IMAGES

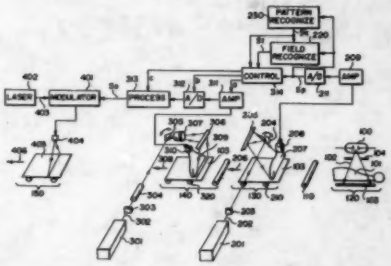
Hideya Takeo, and Kazuo Shimura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 17, 1989, Ser. No. 311,901

Claims priority, application Japan, Feb. 18, 1988, 63-35835; Mar. 19, 1988, 63-66753

Int. Cl.[5] G06K 9/20

U.S. Cl. 382—9 **13 Claims**



1. In a radiation image read-out and reproducing system for scanning a stimulable phosphor sheet, on which a single radiation image or a plurality of radiation images have been stored, with a light beam which causes the stimulable phosphor sheet to emit light in proportion to the amount of energy stored during exposure to radiation, photoelectrically detecting the emitted light to obtain image signals, and reproducing visible images by use of the image signals,

a method for recognizing the layout pattern of radiation images, which comprises the steps of:

(i) preparing in advance a two-valued mask composed of a two-valued signal corresponding to a single type of layout pattern of radiation images which are to be stored on a stimulable phosphor sheet, or preparing in advance two-valued masks each composed of a two-valued signal which corresponds to one of a plurality of types of layout patterns of radiation images which are to be stored on a stimulable phosphor sheet,

(ii) obtaining a preliminary read-out image signal by carrying out preliminary read out, wherein radiation images stored on a stimulable phosphor sheet are approximately ascertained by scanning said stimulable phosphor sheet with a light beam, having an energy level lower than the energy level of the light beam used for the final read out, before the final read out for obtaining said image signal for use in reproduction of visible images is carried out by detecting light emitted by said stimulable phosphor sheet in proportion to the amount of energy stored during exposure to radiation, and

(iii) recognizing the layout pattern of said radiation images by:

(a) converting said preliminary read-out image signals into a two-valued system to obtain a two-valued image signal,

(b) calculating rating values, which represent the degree of pattern matching between said two-valued image signal and each of said two-valued masks,

(c) finding the highest rating value that represents the highest degree of pattern matching among the rating values thus calculated, and

(d) comparing said highest rating value with a predetermined value representing a predetermined degree of pattern matching.

4,962,540
METHOD AND APPARATUS FOR DETECTING CORRESPONDING REGIONS BETWEEN PICTURE IMAGES

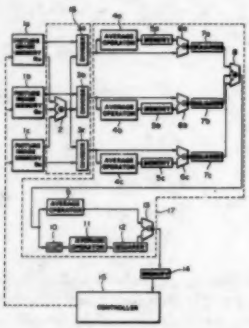
Junpei Tsujiuchi, Kawasake; Shigeto Ikeda, Tokyo; Toshio Honda, Yokohama; Nagaaki Ohyama, Kawasaki; Eric Badique, Tokyo, and Susumu Kikuchi, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 101,328, Sep. 25, 1987, abandoned. This application Nov. 27, 1989, Ser. No. 453,382

Claims priority, application Japan, Sep. 26, 1986, 61-227452; Jun. 11, 1987, 62-145530

Int. Cl.[5] G06K *9/46*

U.S. Cl. 382—17 **35 Claims**



1. A method for detecting corresponding regions between primary color picture images, comprising respective steps of:

detecting mutual color concentration distribution in operation object regions;

converting three primary color signals of color picture images to at least two signals based on said three primary color signals so as to correct influence on brightness of said color picture images;

calculating the variance of the mutual color concentration distribution in the operation object regions of said three primary color picture images from at least two signals obtained by converting said three primary color signals according to said step of converting; and thereafter

detecting a set of said operation object regions of said three primary color picture images in which the variance value which is calculated according to said step of calculating is minimum and which is the corresponding region.

4,962,541
PATTERN TEST APPARATUS

Hideaki Doi, Yokohama; Yasuhiko Hara, Machida; Akira Sase, Katsuta, and Satoshi Shinada, Kamakura, all of Japan, assignors to Hitachi, Ltd. and Hitachi video engineering, Incorporated, both of Tokyo, Japan

Filed Feb. 10, 1988, Ser. No. 154,239

Claims priority, application Japan, Feb. 27, 1987, 62-42671

Int. Cl.[5] G06K *9/62*

U.S. Cl. 382—30 **5 Claims**

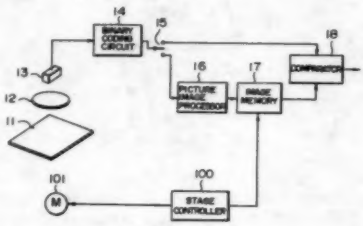
1. An apparatus for testing a testing circuit pattern, comprising:

an imaging means for detecting an image signal by scanning a photo-image of the testing circuit pattern;

a binary coding circuit for converting said image signal to a binary picture element signal;

a reference binary pattern generating means for generating a reference binary pattern signal in synchronism with said scanning;

processing means, including a picture image selecting means for selecting a picture element area having a desired dimension from said reference binary pattern signal, an adding means for calculating a sum of all of binary picture element signals derived from said selected picture element area and a comparing means for comparing the sum with a predetermined reference value and giving a reference binary picture element signal obtained by the comparison to a center picture element of said picture element area so



that said center picture element is reformed to be substantially analogous to the binary picture element signal of the testing circuit pattern; and

means for detecting a defect by comparing said binary picture element signal with said reference binary picture element signal for preventing misjudgment of the corner of said testing circuit pattern.

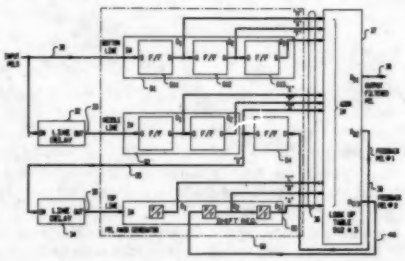
4,962,542
METHOD FOR REDUCING ARTIFACTS IN ERROR DIFFUSED IMAGES

Kevin J. Klees, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 29, 1988, Ser. No. 237,486

Int. Cl.[5] H04N *5/21, 1/40*

U.S. Cl. 382—54 **3 Claims**



1. A method for use in a recursive spatial filter for eliminating visible predefined grain patterns of pel values in scanned from halftone digital images, said method comprising the steps of:

producing, in response to the pel values that form the incoming image, a pel mask having an input pel associated therewith, said pel mask defining an array of pels having columns and rows including said input pel wherein each of said pels in said mask has a corresponding pel value;

storing in memory, said predefined grain patterns of pel values;

determining in response to the values of said pels that form said pel mask, whether said input pel is a part of a grain pattern; and

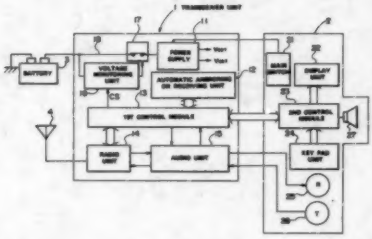
outputting from said memory, at least two feedback pels that interchange the value of said input pel with that of one of the pels in the outermost columns if said input pel is determined to be part of a grain pattern.

4,962,543

BATTERY RUNDOWN PROTECTION SYSTEM FOR AN AUTOMOBILE HAVING A RADIO TELEPHONE APPARATUS WITH AN AUTOMATIC ANSWERING FUNCTION

Toru Kuge, Hino, and Hiroshi Kinoshita, Matsudo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 19, 1988, Ser. No. 246,104
Claims priority, application Japan, Sep. 29, 1987, 62-244608
Int. Cl.[5] H04B 1/40
U.S. Cl. 455—89 8 Claims



1. A control device coupled to a battery and a radio telephone apparatus for controlling a power supply from the battery to the radio telephone apparatus, comprising:

detecting means coupled to the battery for detecting a decrease of a predetermined output voltage of the battery; and

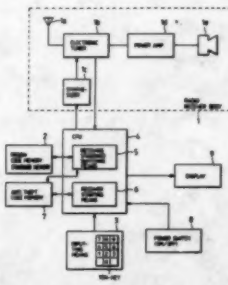
control means responsive to the detecting means for interrupting the power supplied to the radio telephone apparatus in response to the detection of the decrease of the predetermined output voltage at times when a radio communication link is not established between the radio telephone apparatus and another radio telecommunication apparatus, the control means being responsive to the detection of the decrease of the predetermined output voltage for postponing the interruption of the power supplied to the radio telephone apparatus at times when the radio communication link is established between the radio telephone apparatus and another radio telecommunication apparatus, until the radio communication link is terminated.

4,962,544

RADIO RECEIVER

Kenji Igari, Iwaki, Japan, assignor to Alpine Electronics Inc., Tokyo, Japan

Filed Jun. 9, 1989, Ser. No. 364,751
Claims priority, application Japan, Jun. 10, 1988, 63-143073
Int. Cl.[5] H04B 11/16
U.S. Cl. 455—186 2 Claims



1. A radio receiver having a theft prevention system using an anti-theft code, said theft prevention system comprising:

first means for preliminarily storing region codes corresponding to various regions in the world and for preliminarily storing receiving standards in said various regions corresponding to said region codes;

second means for preliminarily storing a first anti-theft code;

means for inputting one of said region codes stored in said first storing means and for inputting an anti-theft code; and

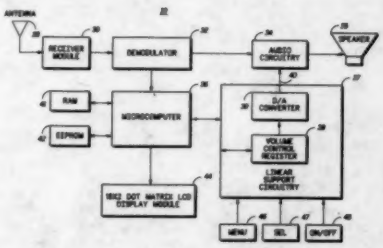
means for switching said receiving standards according to said one of said region codes when one of said region codes is input into said inputting means and after an anti-theft code is input into said inputting means which corresponds with said first anti-theft code, said switching means coupled to said first storing means, to said second storing means, and to said inputting means.

4,962,545

VOLUME LEVEL RETENTION IN A PAGER

Lynne D. Kiaczak, Boynton Beach, and Mark T. Stair, Delray Beach, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 13, 1989, Ser. No. 310,184
Int. Cl.[5] H04B 1/16; H03G 3/00
U.S. Cl. 455—200 4 Claims



1. In a selective call receiver which is selectively energized and de-energized, retentive volume control circuitry comprising:

an audio transducer for emitting an audio signal;

volatile memory means operative to store a volume setting code only when said receiver is energized;

first control means coupled to said audio transducer and first memory means and operative to control the volume of the audio signal emitted by said audio transducer in accordance with the volume setting code of said first memory means;

means for altering the volume setting code of said first memory means;

switch means for generating a first signal to initiate energization of said receiver of a second signal to initiate de-energization of said receiver;

non-volatile memory means operative to store said volume setting code when the receiver is energized and to retain and volume setting code stored therein when the receiver is de-energized; and

second control means coupled to said volatile and non-volatile memory means and governed by said first signal to initially energize the receiver and then transfer the retained volume setting code of the non-volatile memory means to the volatile memory means, and governed by said second signal to initially transfer the volume setting code of the volatile memory means to the non-volatile memory means for storage therein and then de-energize the receiver.

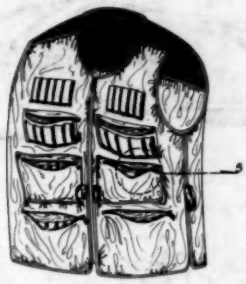
DESIGN PATENTS

GRANTED OCT. 9, 1990

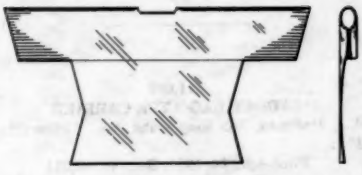
ERRATA

For CLASS	See PATENT NO.
D11-061	310,095
D26-114	310,148
D19-026	310,219
D19-026	310,220

311,085
VEST FOR NURSES
Debra J. Moen, 824 N. Wilton Pl., Los Angeles, Calif. 90038
Filed Apr. 12, 1989, Ser. No. 337,106
Term of patent 14 years
U.S. Cl. D2—190

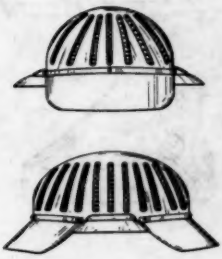


311,086
DISPOSABLE MEDICAL APRON
J. Gordon Short, 4305 Brockbank Way, Holladay, Utah 84124
Filed Oct. 3, 1988, Ser. No. 251,871
Term of patent 14 years
U.S. Cl. D2—226



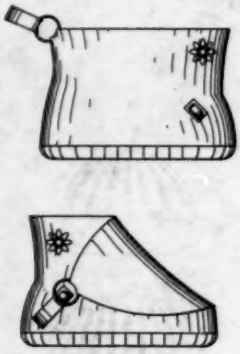
311,087
BABY BATH APRON
Barbara G. Pickard, 119 Jackson St., Selma, Ala. 36701
Filed May 30, 1989, Ser. No. 358,850
Term of patent 14 years
U.S. Cl. D2—226

311,088
PROTECTIVE HAT
John Vargo, 8310 Walter, Mt. Morris, Mich. 48458
Continuation-in-part of Ser. No. 960,186, Nov. 13, 1978. This application Jan. 2, 1981, Ser. No. 222,516
The portion of the term of this patent subsequent to Jul. 9, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D2—232



311,089
HAT
Elena R. Guevara, G-14101 N. Saginaw, Clio, Mich. 48420
Filed Oct. 28, 1987, Ser. No. 114,150
Term of patent 14 years
U.S. Cl. D2—248

311,090
NUCLEAR RADIATION BOOT
Michael J. Dunnigan, 631 S. Newkirk St., Baltimore, Md. 21224
Filed Sep. 8, 1987, Ser. No. 93,864
Term of patent 14 years
U.S. Cl. D2—274

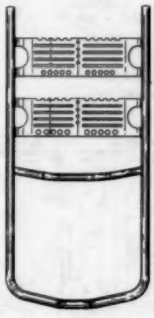


311,091
ELEMENT OF A SHOE UPPER
Kimberly A. McKinstry, Redondo Beach, Calif., assignor to L.A. Gear, Inc., Los Angeles, Calif.
Division of Ser. No. 323,988, Mar. 15, 1989, Pat. No. Des. 305,077. This application Aug. 29, 1989, Ser. No. 400,036
Term of patent 14 years
U.S. Cl. D2—314

311,092
SHOE UPPER
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc. and Nike International Ltd., both of Beaverton, Oreg.
Filed Sep. 14, 1989, Ser. No. 407,018
Term of patent 14 years
U.S. Cl. D2—314

311,093
SADDLE BAG TYPE CARRIER
Ronald J. Hoffman, 545 King Oaks Ave., Collierville, Tenn. 38017
Filed Apr. 24, 1987, Ser. No. 42,011
Term of patent 14 years
U.S. Cl. D3—30.1

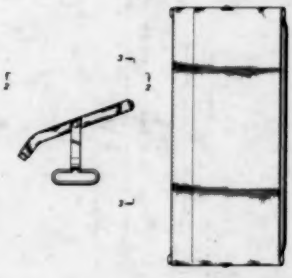
311,094
BACKPACK FRAME
Michael J. Scherer, Boulder, Colo., assignor to American Recreation Products, Inc., New Haven, Mo.
Filed Dec. 23, 1987, Ser. No. 137,442
Term of patent 14 years
U.S. Cl. D3—32



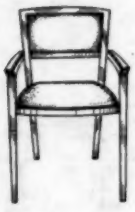
311,095
COMBINED ADDRESS BOOK, CALCULATOR AND KEY RING
Byok N. Kim, #207, Glendale, Calif. 91202
Filed Jan. 31, 1989, Ser. No. 304,339
Term of patent 14 years
U.S. Cl. D11—61

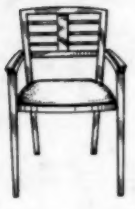
311,096
MIRROR HELD BY TWO FIGURES OF LADIES
Hsu-Chieh Yeh, and Quey-Mei Yeh, both of 1174 Bucknell Dr., Monroeville, Pa. 15146
Filed Mar. 28, 1988, Ser. No. 174,530
Term of patent 14 years
U.S. Cl. D6—305

311,097
BICYCLE SEAT
William N. Sunshine, 5631 Reamer, Houston, Tex. 77096
Filed May 9, 1988, Ser. No. 192,117
Term of patent 14 years
U.S. Cl. D6—354



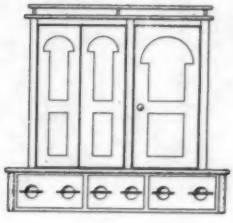
311,098
CHAIR
Gary Lee, and Melvin Hamilton, both of Chicago, Ill., assignors to Helikon Furniture Company, Taftville, Conn.
Filed Mar. 25, 1987, Ser. No. 30,817
Term of patent 14 years
U.S. Cl. D6—380



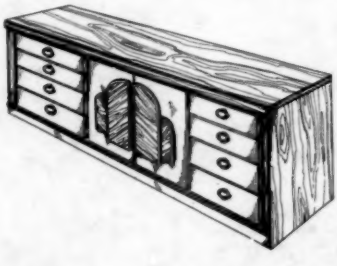


311,099
HALL CONSOLE
Peter M. Yau Kee, Flat 1002, Block A, 10th Floor, Lotto Villa 18 Broadwood Road, Hong Kong, Hong Kong
Filed Jun. 23, 1989, Ser. No. 371,028
Term of patent 14 years
U.S. Cl. D6—397

311,100
CUPBOARD
Jonathan Grey, Midhurst, England, assignor to Smallbone, Inc., New York, N.Y.
Filed Dec. 18, 1987, Ser. No. 134,527
Claims priority, application United Kingdom, Jun. 19, 1987, 1042973
Term of patent 14 years
U.S. Cl. D6—437



311,101
TRIPLE DRESSER
Jericho P. Pauer, Onalaska; Jane Pronschinske Cochrane; and Rick Lappin, La Crosse, all of Wis., assignors to Ashley Furniture Industries, Inc., Arcadia, Wis.
Filed Dec. 30, 1987, Ser. No. 139,422
Term of patent 14 years
U.S. Cl. D6—446



311,102

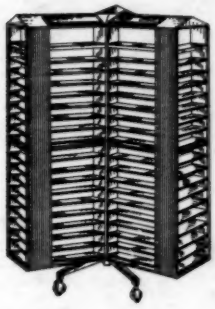
MERCHANDISING DISPLAY STAND OR THE LIKE

William Prendergast, Park Ridge, N.J., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Dec. 5, 1986, Ser. No. 938,773

Term of patent 14 years

U.S. Cl. D6—461



311,103

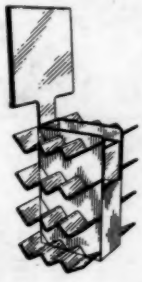
DISPLAY STAND FOR BAKED GOODS AND THE LIKE

Michael J. Kirby, Shawnee Mission, Kans., assignor to Interstate Brands Corporation, Kansas City, Mo.

Filed Jan. 27, 1987, Ser. No. 7,440

Term of patent 14 years

U.S. Cl. D6—468



311,104

SEAT PEDESTAL

Larry D. Smith, Oak Grove, and Robert G. Tanner, St. Charles, both of Mo., assignors to Action Products Co., Inc., Odessa, Mo.

Filed Jun. 8, 1987, Ser. No. 59,280

Term of patent 14 years

U.S. Cl. D6—495

311,105

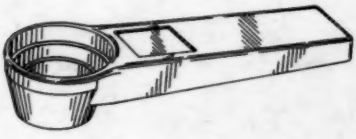
COMBINED ARMREST AND CONTAINER HOLDER

Jon L. Stern, Beverly Hills; Richard S. Katz, Jr., Los Angeles, and Keith A. Hippely, Manhattan Beach, all of Calif., assignors to Cine Coasters Inc., Los Angeles, Calif.

Filed May 14, 1987, Ser. No. 49,412

Term of patent 14 years

U.S. Cl. D6—501



311,106

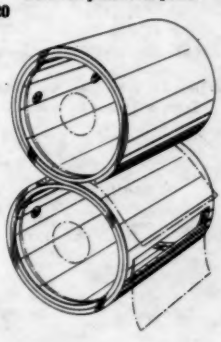
TOILET ROLL HOLDER

Carl C. Jaber, 4287 Halupa St., Honolulu, HI. 96818

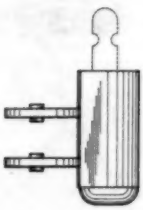
Filed Dec. 2, 1988, Ser. No. 280,186

Term of patent 14 years

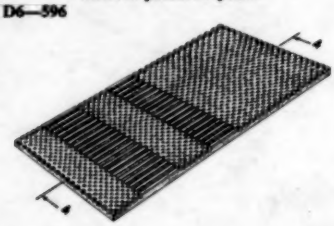
U.S. Cl. D6—520



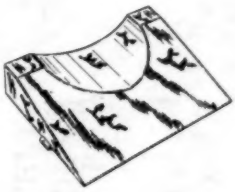
311,107
DRILL SCREW BIT HOLDER
John L. French, 78 Harvard Rd., Littleton, Mass. 01460
Filed May 18, 1988, Ser. No. 195,172
Term of patent 14 years
U.S. Cl. D6—553



311,108
FOAM PAD
David L. Farley, 18672 Evergreen Ave., Yorba Linda, Calif. 92686
Filed Dec. 14, 1988, Ser. No. 284,442
Term of patent 14 years
U.S. Cl. D6—596

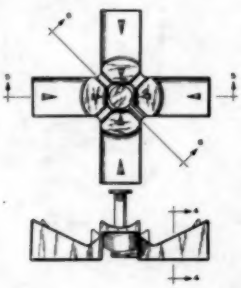


311,109
HEAD AND NECK SUPPORT ATTACHMENT FOR A HEADREST
Robert C. Geschwender, 3855 Orchard, Lincoln, Nebr. 68503
Filed Jun. 30, 1988, Ser. No. 214,029
Term of patent 14 years
U.S. Cl. D6—601

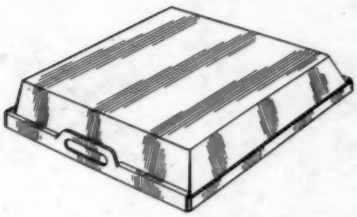


311,110
TEA KETTLE
Milo Hess, Forest Hills, N.Y., assignor to M. Kamenstein, Inc., White Plains, N.Y.
Filed Jan. 10, 1990, Ser. No. 463,960
Term of patent 14 years
U.S. Cl. D7—302

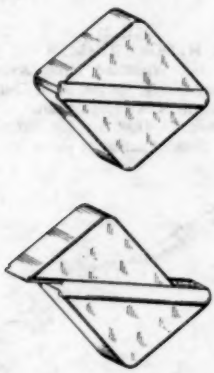
311,111
SUPPORT STAND FOR USE IN BAKING POTATOES
William D. Hiscott, Chicago, Ill.; Ina Witlin, North Miami Beach, Fla.; Theodore J. Hasler, and Andrew T. Jastrzebski, both of Chicago, Ill., assignors to Ekco Housewares, Inc., Franklin park, Ill.
Filed May 5, 1987, Ser. No. 46,306
Term of patent 14 years
U.S. Cl. D7—409



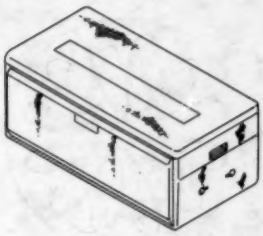
311,112
COMBINED TRAY AND COVER
Blaine Sweatt, III, Minneapolis, and Stephen E. Moorman, Forest Lake, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.
Filed Jan. 19, 1988, Ser. No. 145,168
Term of patent 14 years
U.S. Cl. D7—542



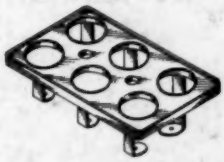
311,113
COMBINED SALT AND PEPPER CONTAINER
Antonietta Magaraggia, née Ferrighi, Verbania Suna, Italy, assignor to A.C.E.A. Manodomestici S.r.L., Casale Corte Cerro, Italy
Filed Dec. 28, 1987, Ser. No. 138,119
Claims priority, application Italy, Jul. 1, 1987, 21924/87[U]
Term of patent 14 years
U.S. Cl. D7—596



311,114
TAILGATER PORTABLE KITCHEN
Vicki A. Orton, 630 S. 170 West, Springville, Utah 84663
Filed Aug. 26, 1987, Ser. No. 89,621
Term of patent 14 years
U.S. Cl. D7—605

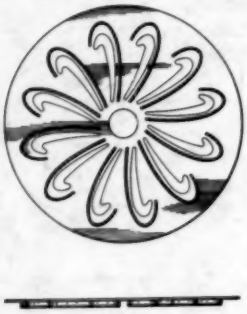


311,115
FLOATING BEVERAGE CARRIER
Tim Abraham, 700 E. Union Ct., Broken Arrow, Okla. 74011
Filed Sep. 7, 1988, Ser. No. 241,273
Term of patent 14 years
U.S. Cl. D7—616

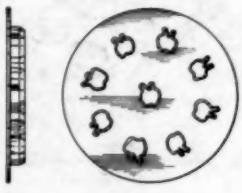


311,116
TUNA CAN SQUEEZER
Robert A. Pentland, 24625 Military Rd. S., Kent, Wash. 98032
Filed Mar. 31, 1988, Ser. No. 176,378
Term of patent 14 years
U.S. Cl. D7—666

311,117
PIE TOPPER PLATE
Joan P. Wolff, Harrison, N.Y., assignor to Coats & Clark, Inc., Yorktown Heights, N.Y.
Filed Apr. 15, 1988, Ser. No. 182,041
Term of patent 14 years
U.S. Cl. D7—675



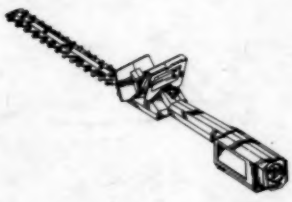
311,118
PIE TOPPER PLATE
Joan P. Wolff, Harrison, N.Y., assignor to Coats & Clark, Inc., Yorktown Heights, N.Y.
Filed Apr. 15, 1988, Ser. No. 182,044
Term of patent 14 years
U.S. Cl. D7—675



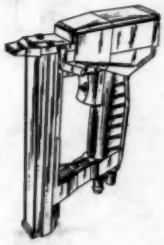
311,119
COMBINED DRINK STIRRER AND PICK
Mannie LaBarbera, 27 G. Walden Ct., Yorktown Hgts., N.Y. 10598
Filed Mar. 28, 1988, Ser. No. 174,020
Term of patent 14 years
U.S. Cl. D7—684

311,120
KITCHEN UTENSIL OR THE LIKE
Victor J. J. Cautereels, Borsbeek; Pieter K. J. DeCoster, Aalst, and Robert H. C. M. Daenen, Erembodegem, all of Belgium, assignors to Dart Industries Inc., Deerfield, Ill.
Filed Jun. 10, 1988, Ser. No. 206,165
Term of patent 14 years
U.S. Cl. D7—688

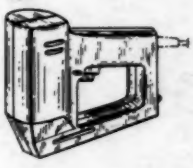
311,121
HEDGE TRIMMER
Edward J. Pilatowicz, Woodland Hills; Anthony Carsello, Chino, and Richard Landy, Saugus, all of Calif., assignors to Allegretti & Company, Chatsworth, Calif.
Filed Aug. 26, 1988, Ser. No. 237,234
Term of patent 14 years
U.S. Cl. D8—8



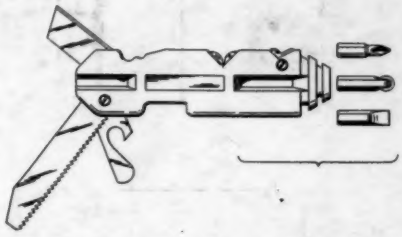
311,122
STAPLE GUN
Nils Johnsson, Axvall; Börje Eriksson, Hjo, and Lars G. Rosenblad, Skärstad, all of Sweden, assignors to Josef Kihlberg AB, Hjo, Sweden
Filed Feb. 10, 1988, Ser. No. 154,619
Claims priority, application Sweden, Aug. 13, 1987, 87-1770
Term of patent 14 years
U.S. Cl. D8—49



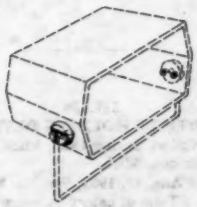
311,123
ELECTRIC STAPLER
Michael J. Mercadante, Quincy, and James S. MacCoskey, Winchester, both of Mass., assignors to Parker Manufacturing Company, Mass.
Filed Apr. 4, 1988, Ser. No. 176,984
Term of patent 14 years
U.S. Cl. D8—69



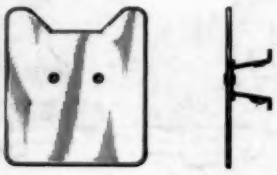
311,124
COMBINATION POCKET TOOL
Alan P. Learney, 17 Totnes Avenue, Bramhall, Cheshire, United Kingdom (SJ7 3PH)
Filed Feb. 11, 1987, Ser. No. 13,621
Claims priority, application United Kingdom, Aug. 19, 1986, 1,036,204
Term of patent 14 years
U.S. Cl. D8—105



311,125
HANDLE POSITIONING ESCUTCHEON
Joseph Zimmerman, 21401 SW. 127th Ave., Miami, Fla. 33177
Filed Jul. 6, 1987, Ser. No. 69,938
Term of patent 14 years
U.S. Cl. D8—352

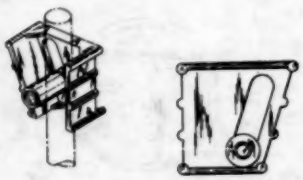


311,126
SHELF EXTENDING MOUNTING BRACKET FOR ADDITIONAL PRODUCT DISPLAY
Joseph Crowley, 9639 Wystone Avenue, Northridge, Calif. 91324
Filed Dec. 23, 1986, Ser. No. 946,279
Term of patent 14 years
U.S. Cl. D8—354



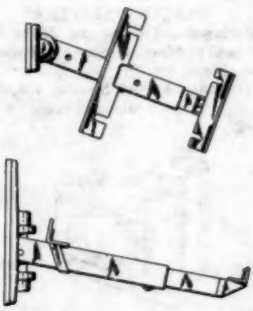
311,127
CLIP
Forrest E. Strodtman, 12934 Hidden Castle, Houston, Tex. 77015
Filed Nov. 7, 1988, Ser. No. 267,916
Term of patent 14 years
U.S. Cl. D8—356

311,128
ARTICLE HOLDING DEVICE
Franklin L. Brevegleri, Spring Lake, Mich., assignor to Geerpres, Inc., Muskegon, Mich.
Filed Aug. 10, 1987, Ser. No. 83,429
Term of patent 14 years
U.S. Cl. D8—373



311,129
GOLF CART UMBRELLA BRACKET
George T. Barnhill, III, Wilmington, Del., assignor to 911 Inc., Wilmington, Del.
Filed Jul. 17, 1989, Ser. No. 380,268
Term of patent 14 years
U.S. Cl. D8—373

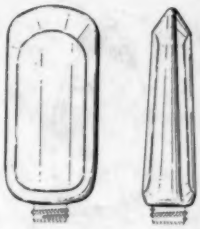
311,130
WALL SUPPORT BRACKET
Richard J. Whitaker, Channel Islands, Channel Islands, assignor to Commercial Brains Limited, Channel Islands, Channel Islands
Filed Feb. 17, 1988, Ser. No. 156,664
Claims priority, application United Kingdom, Aug. 17, 1987, 1044222
Term of patent 14 years
U.S. Cl. D8—381



311,131
COMBINED NUT AND GUARD CAP
Toshihiko Saito, 12-6, Shimouma 6-chome, Setagaya-ku, Tokyo, Japan
Filed Jul. 20, 1987, Ser. No. 75,857
Term of patent 14 years
U.S. Cl. D8—397

311,132
PERFUME BOTTLE
Pierre Dinand, Levallois-Perret, France, assignor to Florbath - Profumi Di Parma SpA, Parma, Italy
Filed Mar. 29, 1988, Ser. No. 174,684
Claims priority, application France, Oct. 20, 1987, 87 6119
Term of patent 14 years
U.S. Cl. D9—367

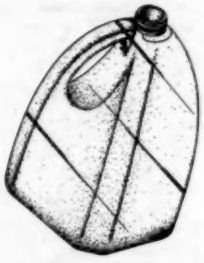
311,133
CONTAINER
Kay E. Wiseman, Burnham, and Brian E. Kichenside, Bushey Heath, both of England, assignors to Conopco, Inc., Greenwich, Conn.
Filed Dec. 19, 1988, Ser. No. 286,670
Claims priority, application United Kingdom, Jun. 20, 1988, 1051641
Term of patent 14 years
U.S. Cl. D9—370



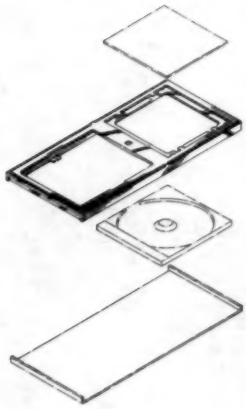
311,134
BOTTLE
Paul Maes, Grimbergen, Belgium, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Apr. 22, 1986, Ser. No. 857,564
The portion of the term of this patent subsequent to Oct. 9, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—378

311,135
BOTTLE
Paul Maes, Grimbergen, Belgium, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Apr. 22, 1986, Ser. No. 857,565
Claims priority, application Benelux, Oct. 31, 1985, 03701-01
The portion of the term of this patent subsequent to Oct. 9, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—378

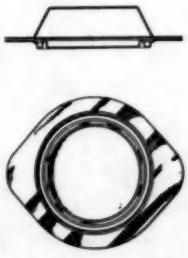
311,136
BOTTLE
Jimmie D. Barker, Blue Springs, and Vincent M. Shortino, Independence, both of Mo., assignors to The Clorox Company, Oakland, Calif.
Filed Dec. 4, 1986, Ser. No. 938,172
Term of patent 14 years
U.S. Cl. D9—378



311,137
THEFT RESISTANT CONTAINER
Anthony Gelardi, Cape Porpoise, Me.; Alan Lowry, Canton, Mass., and Craig Lovecky, Old Orchard Beach, Me., assignors to Shape Inc., Biddeford, Me.
Filed May 29, 1987, Ser. No. 55,776
Term of patent 14 years
U.S. Cl. D9—418

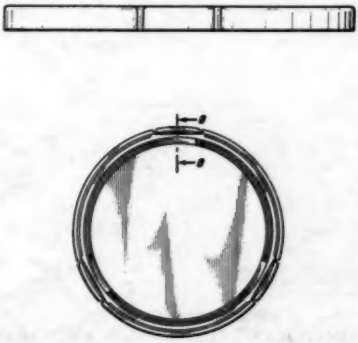


311,138
PACKAGE
Arthur Chanel, Saint-Rémy, France, assignor to Fromageries Bresse-Bleu - Societe Laitiere Cooperative Agricole, Servas, France
Filed Feb. 12, 1988, Ser. No. 155,638
Claims priority, application France, Aug. 12, 1987, 874780
Term of patent 14 years
U.S. Cl. D9—425

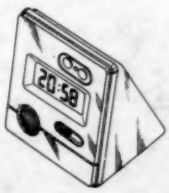


311,139
CONTAINER CLOSURE
Anthony R. Butler, Cromwell, Conn., assignor to Loctite Corporation, Newington, Conn.
Filed Jan. 6, 1988, Ser. No. 141,349
Term of patent 14 years
U.S. Cl. D9—443

311,140
TAMPER RESISTANT CONTAINER LID
James L. Nelson, Temple City, Calif., assignor to Highland Plastics, Pasadena, Calif.
Filed Mar. 4, 1987, Ser. No. 21,421
Term of patent 14 years
U.S. Cl. D9—454



311,141
CLOCK
Ryo Murata, Tachikawa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Jul. 7, 1987, Ser. No. 70,516
Term of patent 14 years
U.S. Cl. D10—15



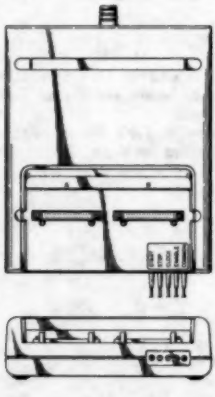
311,142
CLOCK
Knut Hagberg, and Marianne Hagberg, both of Lund, Sweden, assignors to Ikea of Sweden AB, Almhult, Sweden
Filed Nov. 21, 1986, Ser. No. 933,547
Claims priority, application Sweden, May 23, 1986, 86243
Term of patent 14 years
U.S. Cl. D10—24

311,143
COMBINED WATCH AND PHOTO DISPLAY
Donald Lipp, 585 W. End Ave., New York, N.Y. 10024
Filed Apr. 27, 1987, Ser. No. 42,697
Term of patent 14 years
U.S. Cl. D10—31

311,144
ELECTRONIC CLINICAL THERMOMETER
Kenichi Kida, Tokyo, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 30, 1987, Ser. No. 103,262
Claims priority, application Japan, Jul. 31, 1987, 62-30898
Term of patent 14 years
U.S. Cl. D10—57

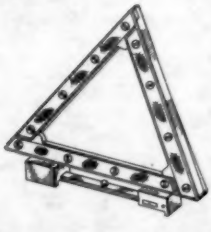
311,145
TRANSIT
Mikio Hayashi, Tokyo, Japan, assignor to World Surveying Instrument Co., Ltd. and Berger Instruments, both of, Japan
Filed Jun. 8, 1987, Ser. No. 59,466
Term of patent 14 years
U.S. Cl. D10—66

311,146
MULTIPLE POINT DIGITAL STIMULUS/RESPONSE PROBE
Cheryl A. Hughes, and Chung K. Liu, both of Seattle, Wash., assignors to John Fluke Mfg. Co., Inc., Everett, Wash.
Filed Feb. 26, 1987, Ser. No. 19,548
Term of patent 14 years
U.S. Cl. D10—75

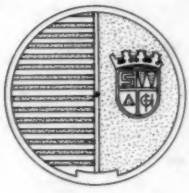


311,147
COUNTER
David S. Thatcher, 6869 Kirkville Rd., East Syracuse, N.Y. 13057
Filed May 11, 1987, Ser. No. 47,993
Term of patent 14 years
U.S. Cl. D10—97

311,148
ILLUMINATED REFLECTIVE EMERGENCY TRAFFIC MARKER
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Apr. 22, 1987, Ser. No. 41,319
Claims priority, application United Kingdom, Nov. 12, 1986, 1038014
Term of patent 14 years
U.S. Cl. D10—114



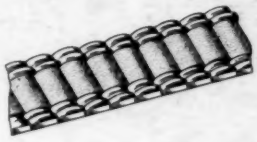
311,149
WATCH DIAL
Jean Robert, Zurich, Switzerland, assignor to Swatch AG, Bienne, Switzerland
Filed May 15, 1989, Ser. No. 351,553
Claims priority, application World Int. Prop. O., Mar. 25, 1986, DM006689
Term of patent 14 years
U.S. Cl. D10—126



311,150
WATCH DIAL
Jean Robert, Zurich, Switzerland, assignor to Swatch AG (Swatch SA), Bienne, Switzerland
Division of Ser. No. 876,339, Jun. 14, 1986 Des. 302531.
This application Jun. 5, 1989, Ser. No. 361,106
Claims priority, application World Int. Prop. O., Dec. 20, 1985, DM/006257
Term of patent 14 years
U.S. Cl. D10—126

311,151
CLOCK MOVEMENT
Koichi Kaneko, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Sep. 4, 1987, Ser. No. 93,898
Claims priority, application Japan, Mar. 6, 1987, 62-8409
Term of patent 14 years
U.S. Cl. D10—129

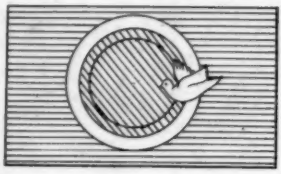
311,152
EXPANSION BRACELET
Murray L. Cowan, Norwood, Mass., assignor to Textron, Inc., Providence, R.I.
Filed Jun. 20, 1988, Ser. No. 208,551
Term of patent 14 years
U.S. Cl. D11—19



311,153
FINGER RING
Michael I. Chirieleison, 365 36th St., Brooklyn, N.Y. 11232
Filed Jul. 25, 1988, Ser. No. 223,763
Term of patent 14 years
U.S. Cl. D11—32

311,154
SHELL EARRINGS
Gloria E. Das, 505 Cativo Dr., Atlanta, Ga. 30311
Filed Sep. 3, 1987, Ser. No. 92,713
Term of patent 14 years
U.S. Cl. D11—48

311,155
FLAG
Arvetta M. Souza, 86 Columbia St., Malden, Mass. 02148
Filed Mar. 23, 1989, Ser. No. 328,342
Term of patent 14 years
U.S. Cl. D11—173

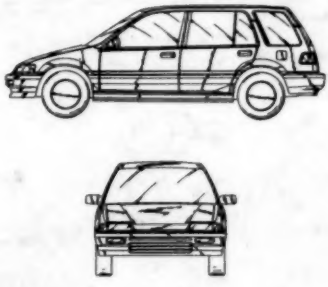


311,156
PULL BOW
Peter S. C. Cheng, 5 Ross Street, Toronto, Ontario, Canada (M5T 1Z8)
Filed Sep. 4, 1987, Ser. No. 92,931
Term of patent 14 years
U.S. Cl. D11—184

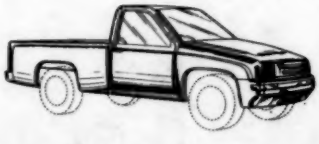
311,157
SCARF SLIDE
Josette Boivin, 50-52 rue de la Saussière, 92100 Boulogne S/Seine, France
Filed Apr. 28, 1988, Ser. No. 189,587
Term of patent 14 years
U.S. Cl. D11—202

311,158
ZIPPER PULL TAB COMBINED WITH DIGITAL TIMEPIECE AND THERMOMETER
Scott T. Soule, 90 Main St., Fryeburg, Me. 04037
Filed May 9, 1986, Ser. No. 862,413
Term of patent 14 years
U.S. Cl. D11—221

311,159
AUTOMOBILE
Koichi Hirata, and Kozo Kikuchi, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 9, 1987, Ser. No. 36,568
Claims priority, application Japan, Oct. 9, 1986, 61-40128
Term of patent 14 years
U.S. Cl. D12—91



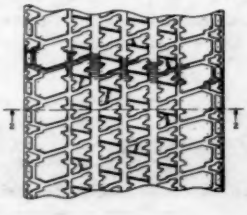
311,160
PICKUP TRUCK BODY
David E. Hackett, El Toro; Kevin K. Hunter, Laguna Niguel, both of Calif., and Kintaro Matsumoto, Hino, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Dec. 29, 1987, Ser. No. 139,693
Term of patent 14 years
U.S. Cl. D12—98



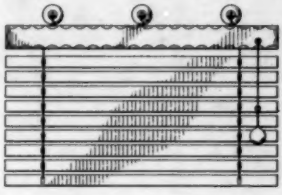
311,161
PADDLE OR SIMILAR ARTICLE
Robert L. Shindlebower, 1140 Cheyenne Rd., Birmingham, Ala. 35215
Filed Mar. 29, 1988, Ser. No. 174,683
Term of patent 14 years
U.S. Cl. D12—215

311,162
CHILD CARRIER
John R. Wright, 126 S. Clark, Tempe, Ariz. 85281
Filed Mar. 1, 1988, Ser. No. 162,470
Term of patent 14 years
U.S. Cl. D12—129

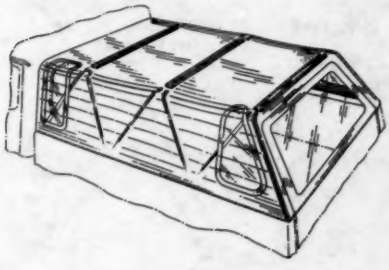
311,163
TIRE TREAD SEGMENT
Delfin A. Rabinovich, Buenos Aires, Argentina, assignor to Fate Socieded Anonima Industrial Comercial e Imobiliaria, Buenos Aires, Argentina
Filed Jan. 27, 1988, Ser. No. 149,112
Term of patent 14 years
U.S. Cl. D12—147



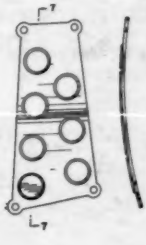
311,164
AUTOMOBILE TRAVEL BLIND FOR INFANT
Agnes F. Douglas, 3521 Palm Rd., Shreveport, La. 71109-7113
Filed Oct. 26, 1988, Ser. No. 262,676
Term of patent 14 years
U.S. Cl. D12—155



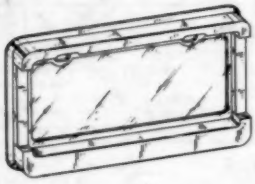
311,165
TRUCK TOP COVER
A. Edward Moore, 215 Grandpre, L'Arcadie, Quebec J0J 1H0, Canada
Filed Mar. 11, 1988, Ser. No. 166,613
Term of patent 14 years
U.S. Cl. D12—156



311,166
AUTOMOBILE PEDAL
Shinichi Asano, Tokyo, Japan, assignor to Car Mate Manufacturing Company Limited, Tokyo, Japan
Filed Oct. 9, 1987, Ser. No. 107,525
Claims priority, application Japan, Apr. 17, 1987, 62-15076
Term of patent 14 years
U.S. Cl. D12—174

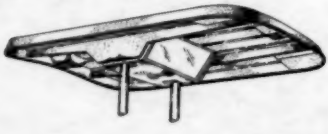


311,167
AUTOMOBILE LICENSE PLATE HOLDER
Lan Ching-Hwei, 65, Hsiang-Shih Road, Sec. 2, Pan-Chiao City, Taipei Hsien, Taiwan
Filed Apr. 6, 1987, Ser. No. 35,492
Term of patent 14 years
U.S. Cl. D12—193

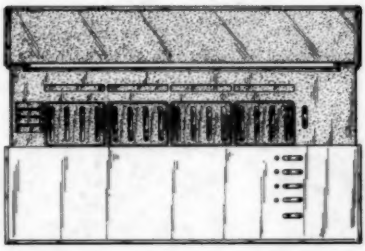


311,168
SAILBOARD HAND GRIP
Colin L. Cooper, 1930 B N. Jameson La., Montecito, Calif. 93108
Filed Jun. 22, 1988, Ser. No. 210,113
Term of patent 14 years
U.S. Cl. D21—317

311,169
SUNSHADE FOR BOATS
Fred O. Hoese, 30706 Wildcat Dr., Bulverde, Tex. 78163
Filed May 26, 1988, Ser. No. 198,922
Term of patent 14 years
U.S. Cl. D12—318



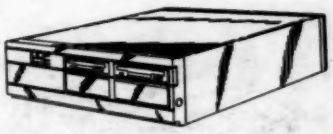
311,170
WALL MOUNTED POWER CONTROL PANEL
Noel Mayo, Philadelphia; Zalman A. Liss, Allentown, and Joel S. Spira, Coopersburg, all of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.
Filed Apr. 14, 1988, Ser. No. 182,076
Term of patent 14 years
U.S. Cl. D13—164



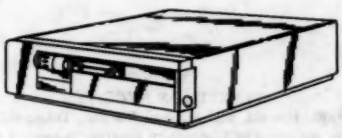
311,171
COMPUTER KEYBOARD
Johan C. Santer, London, England, assignor to Reuters Limited, London, England
Filed Dec. 23, 1986, Ser. No. 945,476
Claims priority, application United Kingdom, Jun. 25, 1986, 1034978
Term of patent 14 years
U.S. Cl. D14—100

311,172
KEYBOARD
Tooru Makidera, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Apr. 13, 1987, Ser. No. 37,566
Claims priority, application Japan, Oct. 17, 1986, 61-41429
Term of patent 14 years
U.S. Cl. D14—100

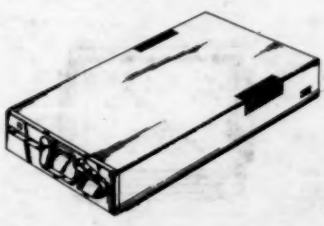
311,173
COMPUTER
Joe S. Cheng, and Ben-Shi Roun, both of Taipei, Taiwan, assignors to Acer Incorporated, Taiwan
Filed Apr. 14, 1988, Ser. No. 181,829
Term of patent 14 years
U.S. Cl. D14—100



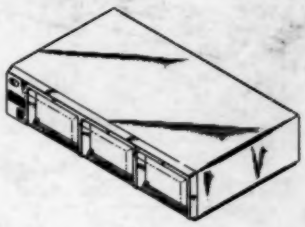
311,174
COMPUTER
Cheng-Chang Lee, and Morris J. Lin, both of Taipei, Taiwan, assignors to Acer Incorporated, Taiwan
Filed Apr. 14, 1988, Ser. No. 182,056
Term of patent 14 years
U.S. Cl. D14—100



311,175
DISKETTE DRIVE
Big J. Lin, 7F., No. 123, Nei Hu Rd. Sec. 1, Taipei, Taiwan
Filed Jul. 14, 1988, Ser. No. 219,032
Term of patent 14 years
U.S. Cl. D14—109

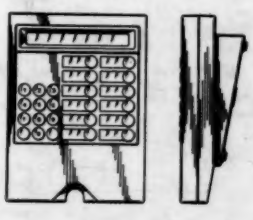


311,176
POWER UNIT COVER FOR THREE PORTABLE HARDFILES OR THE LIKE
David W. Hill, Rochester, Minn., and Margaret C. Sweeney, Georgetown, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 19, 1988, Ser. No. 246,374
Term of patent 14 years
U.S. Cl. D14—100

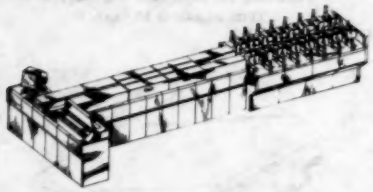


311,177
COMPUTER ENCLOSURE
Leo J. Peters, III, Bellaire, Tex., assignor to PMST Ltd., Houston, Tex.
Filed Jun. 27, 1989, Ser. No. 372,304
Term of patent 14 years
U.S. Cl. D14—102

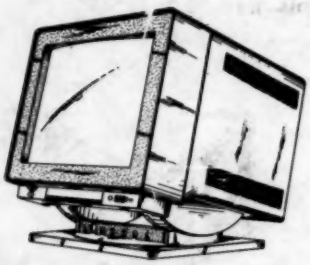
311,178
POINT OF SALE TERMINAL
Douglas E. Goodaer, Charlotte, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jul. 15, 1987, Ser. No. 73,780
Term of patent 14 years
U.S. Cl. D14—105



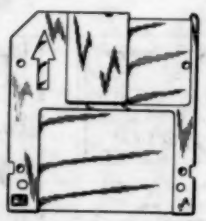
311,179
MAIL SORTER
Charles E. Bain, West Dundee, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed May 11, 1987, Ser. No. 50,221
Term of patent 14 years
U.S. Cl. D14—110



311,180
DISPLAY MONITOR
David L. Schaum, Woodstock, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 21, 1986, Ser. No. 923,079
The portion of the term of this patent subsequent to Aug. 14, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—113

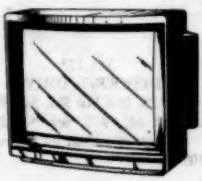


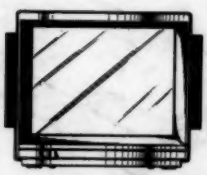
311,181
OPTICAL MAGNETIC DISK CARTRIDGE
Atsushi Miyazawa, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Nov. 3, 1988, Ser. No. 266,975
Claims priority, application Japan, May 9, 1988, 18196/88
Term of patent 14 years
U.S. Cl. D14—114



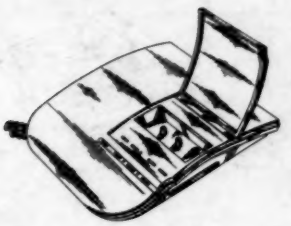
311,182
OPTICAL DISK CARTRIDGE
James E. Nash, St. Paul; David C. Byram, River Falls, and John F. Fairchild, Hugo, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Nov. 14, 1988, Ser. No. 270,109
Term of patent 14 years
U.S. Cl. D14—114

311,183
TELEVISION RECEIVER
Yuzo Fujii, Ibaraki, and Hiroshi Yasuno, Takatsuki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 11, 1987, Ser. No. 131,720
Claims priority, application Japan, Jun. 19, 1987, 62-25138
Term of patent 14 years
U.S. Cl. D14—126

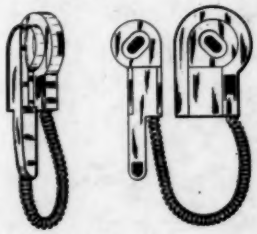




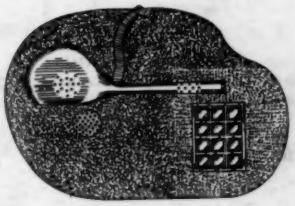
311,184
TELEPHONE ANSWERING MACHINE
Paul Appleby, London, England, assignor to Dialatron Limited, Chessington, England
Filed Jun. 28, 1989, Ser. No. 372,953
Term of patent 14 years
U.S. Cl. D14—141



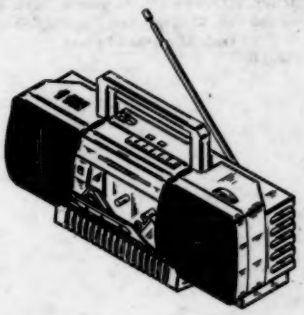
311,185
APPARATUS FOR USE AS HOUSE-PHONE AND/OR INTERNAL PHONE
Lanfranco Chiassi, Milan, Italy, assignor to LT Terraneo S.p.A., Erba, Italy
Filed May 24, 1989, Ser. No. 356,393
Claims priority, application Italy, Dec. 2, 1988, 9516 B/88
Term of patent 14 years
U.S. Cl. D14—142



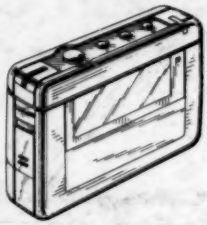
311,186
COMBINATION HANDSET AND BASE TELEPHONE
Donald S. Kingery, 3606 M. Royal Blvd., Glenshaw, Pa. 15116
Division of Ser. No. 148,225, Jan. 25, 1988, Pat. No. Des. 303,66. This application Apr. 10, 1989, Ser. No. 335,534
Term of patent 14 years
U.S. Cl. D14—143



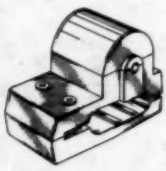
311,187
COMBINED TAPE RECORDER AND RADIO
Tatsuo Mori, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jun. 8, 1988, Ser. No. 204,185
Claims priority, application Japan, Dec. 11, 1987, 62-50836
Term of patent 14 years
U.S. Cl. D14—163



311,188
DIGITAL DISPLAY PAGER
Takashi Oyamada, and Mamoru Takahashi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed May 18, 1987, Ser. No. 51,114
Claims priority, application Japan, Nov. 28, 1986, 47416/1986
Term of patent 14 years
U.S. Cl. D14—191



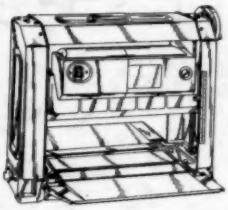
311,189
MICROPHONE MOUNT
John J. Lazzeroni, and Melinda K. Lazzeroni, both of 7322 E. Stella Rd., Tucson, Ariz. 85730
Filed Jun. 24, 1987, Ser. No. 65,706
Term of patent 14 years
U.S. Cl. D14—229



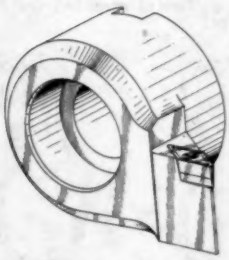
311,190
LEAF ORNAMENTED TELEPHONE CORD OR SIMILAR ARTICLE
Lewis M. McCoy, P.O. Box 836, Newcastle, Wyo. 82701
Filed Feb. 13, 1989, Ser. No. 310,846
Term of patent 14 years
U.S. Cl. D14—240

311,191
TELEPHONE SET
Takaharu Ando, Ryugasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Jun. 2, 1989, Ser. No. 360,746
Claims priority, application Japan, Dec. 24, 1988, 63-50027
Term of patent 14 years
U.S. Cl. D14—241

311,192
PLANER OR SIMILAR ARTICLE
Boy-Yann Juang, 88-10, Tung-Ping Rd., Taiping Hsiang, Taichung, Taiwan
Filed Jun. 24, 1988, Ser. No. 211,405
Term of patent 14 years
U.S. Cl. D15—127



311,193
HEAD FOR A CUTTING TOOL
Kjell Andersson, and Carl-Axel Andersson, both of Fagersta, Sweden, assignors to Seco Tools AB, Fagersta, Sweden
Filed Apr. 17, 1987, Ser. No. 39,374
Claims priority, application Sweden, Oct. 31, 1986, 86-2537
The portion of the term of this patent subsequent to Jun. 19, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D15—139

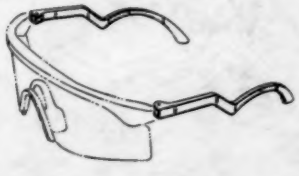


311,194
CUTTING TOOL HOLDER
Wlajko Mihic, Tegnérvägen 9, Gävle, S-802 28, Sweden
Filed Jul. 21, 1986, Ser. No. 888,312
Claims priority, application Sweden, Jan. 29, 1986, 86-0222
Term of patent 14 years
U.S. Cl. D15—140

311,195
SUN GLASSES
Pierre Berthet-Bondet, Oyonnax, France, assignor to Societe Berthet-Bondet, Oyonnax, France
Filed Jun. 20, 1988, Ser. No. 208,568
Claims priority, application France, Dec. 21, 1987, 87 7669
Term of patent 14 years
U.S. Cl. D16—102

311,196
NOSE PAD FOR EYEGLASSES
Helmut Wiedmann, Heilbronn, Fed. Rep. of Germany, assignor to Eyemetrics-Systems AG, Chur, Switzerland
Filed May 4, 1987, Ser. No. 45,675
Term of patent 14 years
U.S. Cl. D16—126

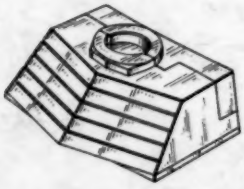
311,197
EYEGLASS EARSTEM
James H. Jannard, Laguna Niguel, Calif., assignor to Oakley, Inc., Irvine, Calif.
Filed May 16, 1988, Ser. No. 194,579
Term of patent 14 years
U.S. Cl. D16—127



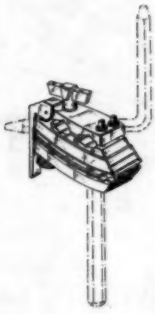
311,198
CAMERA PLATFORM
Yoshinobu Kosugi, and Tadashi Idota, both of Sayama, Japan, assignors to Slik Tripod Co., Ltd., Saitama, Japan
Filed Jul. 23, 1987, Ser. No. 76,864
Claims priority, application Japan, Jan. 27, 1987, 62-2534
Term of patent 14 years
U.S. Cl. D16—243

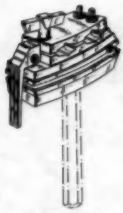
311,199
SHOULDER CAMERA MOUNT
John T. Casagrande, 2606 N. Parrish Pl., Burbank, Calif. 91504
Filed Mar. 17, 1987, Ser. No. 26,655
Term of patent 14 years
U.S. Cl. D16—243

311,200
DRUM HOLDER MOUNT
Masamichi Nakayama, Nagoya, and Yoshiki Hoshino, Owariasahi, both of Japan, assignors to Hoshino Gakki Co., Ltd., Japan
Filed Feb. 5, 1987, Ser. No. 11,224
Term of patent 14 years
U.S. Cl. D17—22

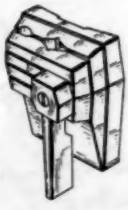


311,201
DRUM HOLDER CLAMP
Masamichi Nakayama, Nagoya, and Yoshiki Hoshino, Owariasahi, both of Japan, assignors to Hoshino Gakki Co., Ltd., Japan
Filed Feb. 5, 1987, Ser. No. 11,225
Term of patent 14 years
U.S. Cl. D17—22



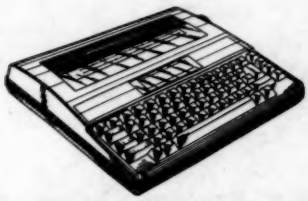


311,202
CLAMP FOR DRUM
Masamichi Nakayama, Nagoya, and Yoshiki Hoshino, Owariasahi, both of Japan, assignors to Hoshino Gakki Co., Ltd., Japan
Filed Feb. 5, 1987, Ser. No. 11,228
Term of patent 14 years
U.S. Cl. D17—22



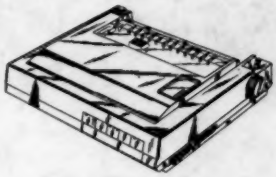
311,203
SNARE DRUM LUG CASING
Mitsuo Yanagisawa, Chiba, Japan, assignor to Pearl Musical Instrument Co., Chiba, Japan
Filed Apr. 22, 1988, Ser. No. 184,709
Term of patent 14 years
U.S. Cl. D17—22

311,204
ELECTRONIC TYPEWRITER
Masaki Hayashi, Hino, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Oct. 22, 1987, Ser. No. 112,756
Claims priority, application Japan, Jul. 3, 1987, 62-27140
Term of patent 14 years
U.S. Cl. D18—1



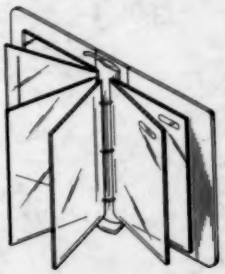
311,205
PRINTER
Toshio Mitsuhashi, Narashino, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Jun. 8, 1987, Ser. No. 59,379
Claims priority, application Japan, Feb. 12, 1987, 62-4710
Term of patent 14 years
U.S. Cl. D18—13

311,206
PRINTER
Isao Sugimoto, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Jun. 8, 1987, Ser. No. 59,482
Claims priority, application Japan, Feb. 13, 1987, 62-5043
Term of patent 14 years
U.S. Cl. D18—13



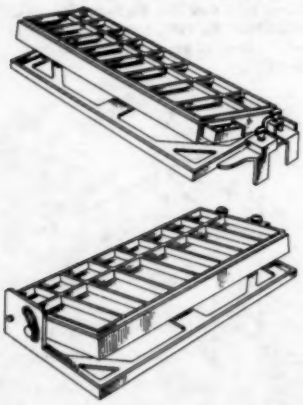
311,207
PRINTER
Toshio Mitsuhashi, Narashino, Japan, assignór to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Jun. 8, 1987, Ser. No. 59,483
Claims priority, application Japan, Feb. 12, 1987, 62-4711
Term of patent 14 years
U.S. Cl. D18—13

311,208
GREETING CARD ALBUM
Audrey C. Folson, P.O. Box 892, Sarasota, Fla. 34230
Filed Nov. 30, 1987, Ser. No. 126,426
Term of patent 14 years
U.S. Cl. D19—27



311,209
BOOKMARK
Roy M. Svee, Bloomington, Minn., assignor to J. B. Goodhouse, Inc., Bloomington, Minn.
Filed Sep. 5, 1989, Ser. No. 402,255
Term of patent 14 years
U.S. Cl. D19—34

311,210
COMBINED PALETTE AND HOLDER THEREFOR
Dallas R. Bottcher, 3300 N. 75th St., Lincoln, Nebr. 68507
Filed Nov. 4, 1986, Ser. No. 926,996
Term of patent 14 years
U.S. Cl. D19—35

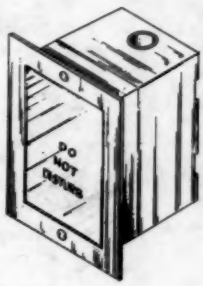


311,211
COMBINED MARKING PEN AND CAP THEREFOR
MaryAnn Oot, 215 Scarboro Dr., Solvay, N.Y. 13209
Filed Jun. 10, 1987, Ser. No. 60,374
Term of patent 14 years
U.S. Cl. D19—43

311,212
PAPER CLIP
Shintaro Tsuji, Tokyo, Japan, assignor to Sanrio Company, Ltd., Tokyo, Japan
Filed Apr. 16, 1987, Ser. No. 39,593
Claims priority, application Japan, Oct. 18, 1986, 61-041134
Term of patent 14 years
U.S. Cl. D19—65

311,213
PENCIL CUP
Jane Ancona, and Bruce Ancona, both of New York, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.
Filed Nov. 20, 1989, Ser. No. 439,169
Term of patent 14 years
U.S. Cl. D19—77

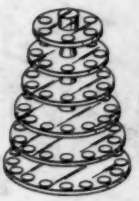
311,214
ILLUMINATED SIGN
Constantin Malinovsky, Miami, Fla., assignor to Architectural Creative Lighting, Inc., Miami, Fla.
Filed Apr. 23, 1987, Ser. No. 41,593
Term of patent 14 years
U.S. Cl. D20—42



311,215
PLANT TAG
Robert C. Hickmott, Lansing, Mich., assignor to The John Henry Company, Lansing, Mich.
Filed Sep. 23, 1987, Ser. No. 100,007
Term of patent 14 years
U.S. Cl. D20—26

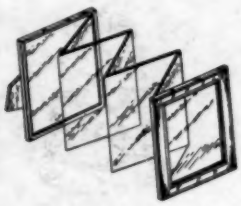
311,216
GOLF PUTTING PRACTICE DEVICE
Luther G. Simjian, Fort Lauderdale, Fla., assignor to Command Automation, Inc., Fort Lauderdale, Fla.
Filed Jun. 17, 1987, Ser. No. 63,279
Term of patent 14 years
U.S. Cl. D21—8

311,217
THREE-DIMENSIONAL GAME BOARD
Christine E. Meyers, and Glenn M. Meyers, both of 38 Knoll Ridge Dr., Asheville, N.C. 28804
Filed Dec. 18, 1987, Ser. No. 134,919
Term of patent 14 years
U.S. Cl. D21—23

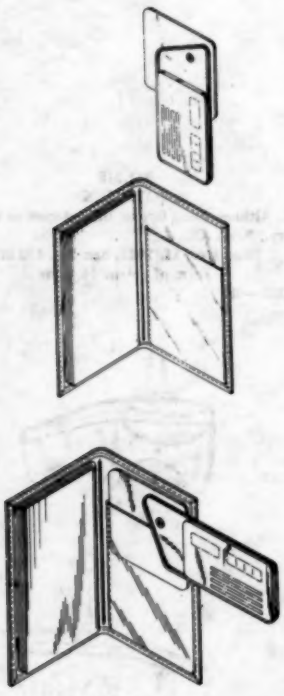


311,218
JOYSTICK
Richard K. Althans, Long Grove, Ill., assignor to Wico Distribution Corp., Niles, Ill.
Filed Dec. 11, 1987, Ser. No. 132,051
Term of patent 14 years
U.S. Cl. D21—48

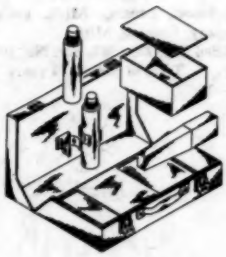
311,219
COMBINATION PICTURE FRAME AND EXPANDABLE PHOTO ALBUM
George G. Bergh, Plainville, Mass., assignor to Bergh Bros. Co., Inc., Attleboro Falls, Mass.
Filed Jun. 5, 1989, Ser. No. 361,109
Term of patent 14 years
U.S. Cl. D19—26



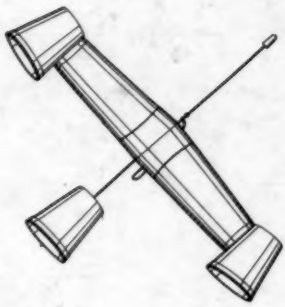
311,220
POCKET SECRETARY WITH FLIP OUT PANEL
Raymond Kam, Kowloon, Hong Kong, assignor to R.A.W. Consultants, Inc., Searingtown, N.Y.
Filed Aug. 11, 1987, Ser. No. 392,850
Term of patent 14 years
U.S. Cl. D19—26



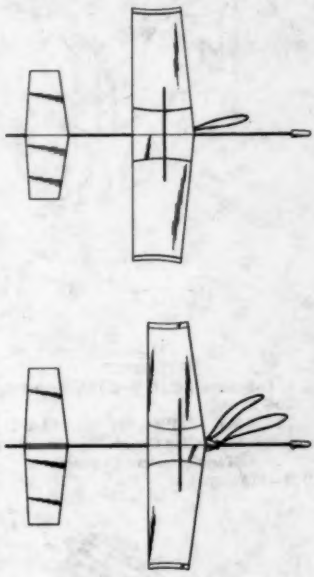
311,221
COMBINED BINGO ACCESSORIES AND CARRYING CASE
Arnold H. Solo, 726 Hamo Dr., Holiday, Fla. 33590
Filed Jul. 9, 1987, Ser. No. 73,117
Term of patent 14 years
U.S. Cl. D21—54

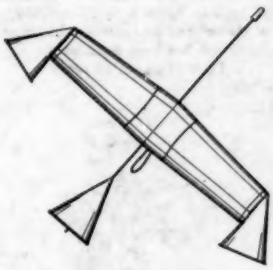


311,222
TOY KITE
John J. Kovats, Fernandina Beach, Fla., assignor to Space Adventures, Incorporated, Jacksonville, Fla.
Filed Dec. 27, 1988, Ser. No. 289,783
Term of patent 14 years
U.S. Cl. D21—89



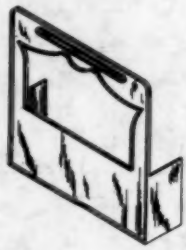
311,223
TOY KITE
John J. Kovats, Fernandina Beach, Fla., assignor to Space Adventures, Incorporated, Jacksonville, Fla.
Filed Dec. 27, 1988, Ser. No. 289,785
Term of patent 14 years
U.S. Cl. D21—89



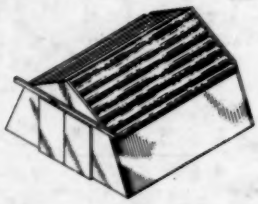


311,224
TOY BUILDING ELEMENT
Flemming H. Olsen, Espergærde, Denmark, assignor to Interlego A.G., Switzerland
Filed Nov. 29, 1988, Ser. No. 277,910
Term of patent 14 years
U.S. Cl. D21—108

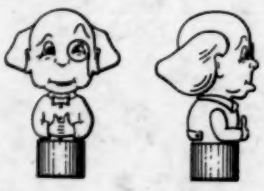
311,225
TOY PUPPET STAGE
Frederick H. Kroll, 11289 Piping Rock Dr., Boynton Beach, Fla. 33437
Filed Jun. 2, 1989, Ser. No. 360,714
Term of patent 14 years
U.S. Cl. D21—114



311,226
TOY SHED
Donald G. J. LaBossiere, P.O. Box 123, Treherne, Manitoba, Canada (R0G 2V0)
Filed Sep. 12, 1988, Ser. No. 243,494
Claims priority, application Canada, Apr. 25, 1988, 25-04-88-6
Term of patent 14 years
U.S. Cl. D21—114



311,227
FINGER PUPPET
Nicholas S. Rotondo, 108 E. 14th St., Wilmington, Del. 19801
Filed Aug. 10, 1987, Ser. No. 83,428
Term of patent 14 years
U.S. Cl. D21—153



311,228
DOLL
Loretta Smith, 4771 NE. 6th Ave., Fort Lauderdale, Fla. 33334
Filed Jul. 22, 1987, Ser. No. 76,410
Term of patent 14 years
U.S. Cl. D21—166

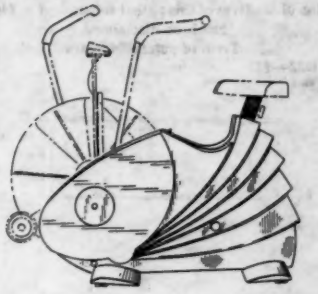
311,229
DOLL
Trevor A. Robinson, 1624 Nostrand Ave., Brooklyn, N.Y. 11226
Filed Jan. 8, 1987, Ser. No. 1,538
The portion of the term of this patent subsequent to Sep. 25, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—168

311,230
GUARDIAN ANGEL DOLL
Sharyl J. Hutchison, Warrior Inn, Junction 44 & 18, Winner, S. Dak. 57580
Filed Jun. 8, 1987, Ser. No. 59,312
Term of patent 14 years
U.S. Cl. D21—169

311,231
DOLL
Mickie C. Emmons, Indianapolis, Ind., assignor to The Kamper Family, Inc., Indianapolis, Ind.
Filed Jun. 27, 1986, Ser. No. 879,554
Term of patent 14 years
U.S. Cl. D21—171

311,232
ANKLE EXERCISER OR SIMILAR ARTICLE
Denis B. Drennan, Evanston, and Donald J. Maylahn, Skokie, both of Ill., assignors to DM Systems, Inc., Evanston, Ill.
Continuation of Ser. No. 653,086, Sep. 21, 1984. This application Dec. 1, 1986, Ser. No. 935,609
Term of patent 14 years
U.S. Cl. D21—191

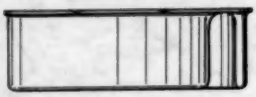
311,233
HOUSING FOR AN EXERCISE BICYCLE
Christopher J. Hornung, 704 Huron Hill, Madison, Wis. 53711
Filed Nov. 14, 1988, Ser. No. 270,305
Term of patent 14 years
U.S. Cl. D21—194



311,234
COMBINED PRACTICE KICK BAG STAND AND SUPPORT
Jalil Arami-Nikjeh, 7805 Reseda Blvd., Apt. 202, Reseda, Calif. 91335
Filed Nov. 25, 1987, Ser. No. 125,078
Term of patent 14 years
U.S. Cl. D21—199

311,235
COVER FOR TAMPER RESISTANT BAIT TRAY OR SIMILAR ARTICLE
Bryan E. Petersen, Westwood, and Michael Kanceljak, Bloomingdale, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.
Filed Oct. 1, 1987, Ser. No. 54,153
The portion of the term of this patent subsequent to Oct. 9, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D22—119

311,236
TAMPER RESISTANT BAIT TRAY OR SIMILAR ARTICLE
Bryan E. Petersen, Westwood, and Michael Kanceljak, Bloomingdale, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.
Filed Oct. 1, 1987, Ser. No. 54,154
The portion of the term of this patent subsequent to Oct. 9, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D22—119



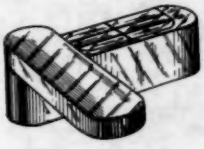
311,237
COVER FOR TAMPER RESISTANT BAIT TRAY OR SIMILAR ARTICLE
Bryan E. Petersen, Westwood, and Michael Kanceljak, Bloomingdale, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.
Filed Oct. 1, 1987, Ser. No. 54,155
The portion of the term of this patent subsequent to Oct. 9, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D22—119

311,238
TAMPER RESISTANT BAIT TRAY OR SIMILAR ARTICLE
Bryan E. Petersen, Westwood, and Michael Kanceljak, Bloomingdale, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.
Filed May 26, 1987, Ser. No. 54,159
The portion of the term of this patent subsequent to Oct. 9, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D22—119

311,239
OIL FILTER ADAPTOR FOR USE WITH AN INTERNAL COMBUSTION ENGINE
Alan Lundquist, 201 A Industrial Ct., Wylie, Tex. 75098
Filed May 9, 1988, Ser. No. 191,492
Term of patent 14 years
U.S. Cl. D23—209

311,240
PUMP SPRAYER PRESSURE TANK OR SIMILAR ARTICLE
Gerald W. Born, Eldora, Iowa, assignor to Quality Products, Inc., Eldora, Iowa
Filed Aug. 2, 1985, Ser. No. 761,894
Term of patent 14 years
U.S. Cl. D23—225

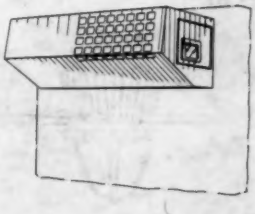
311,241
BATHROOM FAUCET
Joseph Strignano, New York, N.Y., assignor to I. W. Industries, Melville, N.Y.
Filed Apr. 16, 1987, Ser. No. 39,640
Term of patent 14 years
U.S. Cl. D23—241



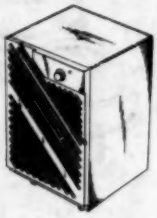
311,242
TOILET
Mary J. Reid, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Jan. 11, 1988, Ser. No. 142,779
Term of patent 14 years
U.S. Cl. D23—301

311,243
WATER CLOSET
Michael C. Vaupel, South Laguna, and Kenneth P. Mendoza, Whittier, both of Calif., assignors to Masco Building Products Corp., Taylor, Mich.
Filed Aug. 16, 1989, Ser. No. 394,790
Term of patent 14 years
U.S. Cl. D23—301

311,244
COVER FOR A TRANSPORT REFRIGERATION UNIT
Peter B. Allard, Minnetonka; Michael R. Weiss, Richfield, and Gregory D. Bleck, Chaska, all of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.
Filed Mar. 2, 1988, Ser. No. 162,843
Term of patent 14 years
U.S. Cl. D23—325



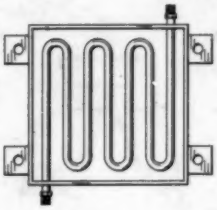
311,245
DEHUMIDIFIER
Suk J. Choi, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea
Filed Dec. 9, 1988, Ser. No. 281,796
Claims priority, application Rep. of Korea, Jun. 10, 1988, 62-7947
Term of patent 14 years
U.S. Cl. D23—359



311,246
AIR FRESHENER DOLL
Sherna F. Cain, Van Buren, Ark., assignor to Triple H. Industries, Inc., Van Buren, Ark.
Filed Mar. 3, 1987, Ser. No. 21,329
Term of patent 14 years
U.S. Cl. D23—368

311,247
CEILING FAN UNIT
Robert Sonneman, New York, N.Y., assignor to Sonneman Design Group, Inc., Long Island City, N.Y.
Filed Jan. 19, 1988, Ser. No. 145,776
Term of patent 14 years
U.S. Cl. D23—377

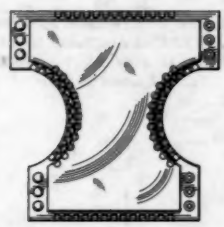
311,248
WATER COOLER
John W. Hall, 1609 Mockingbird La., Southlake, Tex. 76092
Filed Feb. 25, 1988, Ser. No. 160,163
Term of patent 14 years
U.S. Cl. D23—386



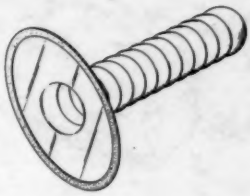
311,249
BLOOD COLLECTING TUBE
Masaaki Kassi, Yamanashi, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 14, 1987, Ser. No. 108,291
Claims priority, application Japan, Jul. 31, 1987, 62-30882; Jul. 31, 1987, 62-30883; Jul. 31, 1987, 62-30884
Term of patent 14 years
U.S. Cl. D24—29

311,250
BUBBLE GENERATOR FOR A BATHTUB
Yoshikiyo Yamasaki, Osaka, Japan, assignor to Kabushiki Kaisha Japan Health and Kabushiki Kaisha Fuji Iryoki, Osaka, Japan
Filed Apr. 15, 1988, Ser. No. 182,045
Term of patent 14 years
U.S. Cl. D24—38

311,251
DIAPER
Jane Jones, 1432 Johnston Dr., Oklahoma City, Okla. 73119
Filed Jun. 22, 1988, Ser. No. 210,762
Term of patent 14 years
U.S. Cl. D24—50

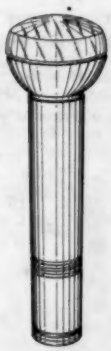


311,252
CONDOM
Minnie L. Pettway, 406 Second Ave., Stratford, Conn. 06497
Filed May 6, 1988, Ser. No. 191,601
Term of patent 14 years
U.S. Cl. D24—99



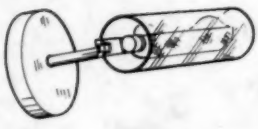
311,253
SERVICE BUILDING
Dale E. Bull, East Peoria, Ill., assignor to Engine Service Specialist Inc., Peoria, Ill.
Filed Jun. 8, 1988, Ser. No. 204,149
Term of patent 14 years
U.S. Cl. D25—33

311,254
FLASHLIGHT
Pierre Y. Clair, Vernon, France, assignor to Cipel, Levallois-Perret, France
Filed Dec. 20, 1988, Ser. No. 287,983
Claims priority, application France, Aug. 11, 1988, 88 5150
Term of patent 14 years
U.S. Cl. D26—49

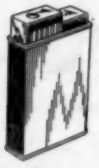


311,255
HOUSING FOR A SOLAR POWERED LIGHT
James C. Spotts, Kowloon, Hong Kong, assignor to Australux North America Limited, Hong Kong
Filed Mar. 7, 1989, Ser. No. 320,046
Term of patent 14 years
U.S. Cl. D26—67

311,256
WALL LAMP
Gianfranco Frattini, Milan, Italy, assignor to Artemide S.p.A., Milan, Italy
Filed Dec. 5, 1988, Ser. No. 280,392
Claims priority, application Italy, Jun. 10, 1988, 21407[U]
Term of patent 14 years
U.S. Cl. D26—87



311,257
LIGHTER OR THE LIKE
Kaname Ichikawa, Tokyo, Japan, assignor to Modern Royal Company, Ltd., Tokyo, Japan
Filed Nov. 29, 1988, Ser. No. 277,223
Claims priority, application Japan, Oct. 19, 1988, 63-40645
Term of patent 14 years
U.S. Cl. D27—154



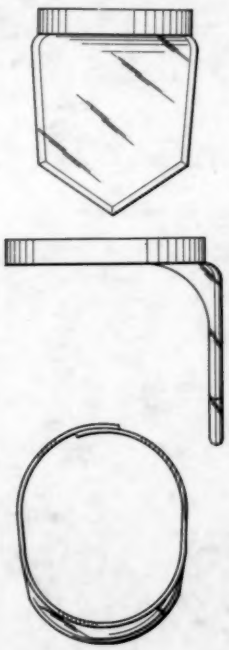
311,258
NAIL POLISH APPLICATOR
Axel Jankewitz, Furth, Fed. Rep. of Germany, assignor to A.W. Faber-Castell Unternehmungsverwaltung GmbH & Co., Stein, Fed. Rep. of Germany
Filed Jul. 1, 1987, Ser. No. 70,867
Term of patent 14 years
U.S. Cl. D28—7

311,259
DENTAL FLOSS CONTAINER
Rosemary M. Smith, 85 Cocasset St., Foxboro, Mass. 02035
Filed May 20, 1987, Ser. No. 51,610
Term of patent 14 years
U.S. Cl. D28—64

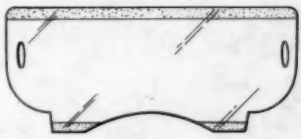
311,260
LIP BALM CARTRIDGE HOLDER
Donald C. Hasert, 13703 32nd Ave. South, Seattle, Wash. 98168
Filed May 18, 1988, Ser. No. 196,227
Term of patent 14 years
U.S. Cl. D28—85

311,261
HARD HAT HEAD PROTECTOR
D. Jean Avey, Rte. 1, Box 90, Albert, Kans. 67511
Filed Oct. 24, 1986, Ser. No. 923,662
Term of patent 14 years
U.S. Cl. D29—16

311,262
HEALTH WORKER'S FACE SHIELD
Judith A. Curry, 56 S. Railroad Ave., Mahwah, N.J. 07430
Filed Dec. 3, 1987, Ser. No. 128,507
Term of patent 14 years
U.S. Cl. D29—17



311,263
EYE SHIELD
John P. Russell, Gardendale, Ala., assignor to BFD, Inc., Gardendale, Ala.
Filed May 4, 1988, Ser. No. 190,216
Term of patent 14 years
U.S. Cl. D29—17



311,264
AQUARIUM
Kenneth L. Stramel, 10422 N. Chatfield Dr., Littleton, Colo. 80125
Filed Oct. 13, 1978, Ser. No. 257,348
Term of patent 14 years
U.S. Cl. D30—101

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Woss, Gerhard; and Leitmeier, Klaus, 4,962,328, Cl. 307-491.000.

Avrahami, Zohar; Larom, Dov; Zucker, Shlomo; and Gross, Joseph, to Elecsys Ltd.; and Product Development(Z.G.S)Ltd. Ultrasonic nebulizer. 4,961,885, Cl. 261-142.000.

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Revici, Emanuel, 4,962,129, Cl. 514-724.000.

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LaRue, Albert M., 4,961,549, Cl. 244-134.00A.
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Henn, Robert L.; Sakhpara, Dilip J.; Bailey, Christian E.; Bowser, John J.; and Brown, Peter L., 4,961,985, Cl. 428-196.000.

Bailey, David W., to Uniroyal Goodrich Tire Company, The. Servicer for tire building machine. 4,961,813, Cl. 156-406.400.

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Bormans, Bernardus J. M.; and Bakker, Johan G., 4,962,308, Cl. 250-396.00R.

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Jabarin, Saleh A.; and Balduff, Dennis C., 4,962,164, Cl. 525-445.000.

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Barnes, Austen. Modular edge conditioner. 4,961,334, Cl. 72-129.000.

Barnes, David; and Sharp, Alick M., to Rotation Limited. Apparatus for playing a game. 4,961,581, Cl. 273-236.000.

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Barth, John M., to Hoover Universal, Inc. Apparatus for forming plastic bottle base cups. 4,961,701, Cl. 425-527.000.
Bartz, Herbert J. Hydraulic actuation system. 4,961,481, Cl. 188-130.000.
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Marhold, Albrecht; and Braden, Rudolf, 4,962,246, Cl. 570-127.000.
Bayer, Ernst; and Fischer, Karl, to U.S. Philips Corporation. Recording and/or reproducing apparatus for a record carrier in the form of a tape. 4,962,436, Cl. 360-96.300.
Beard, Walter C. Dispensing package. 4,961,727, Cl. 604-75.000.
Beatty, Ronald L.: *See*—
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Beauregard, Gary M.; Loucks, Larry K.; Nguyen, Khoa D.; and Urquhart, Robert J., to International Business Machines Corporation. System and method for utilizing fast polygon fill routines in a graphics display system. 4,962,468, Cl. 364-521.000.
Beck, Charles E. J.: *See*—
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Kosinski, Anthony J., 4,961,728, Cl. 604-110.000.
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Bedbrook, John R.; Dean, Caroline; and Dunsmuir, Pamela, to DNA Plant Technology Corporation. Plant promotors. 4,962,028, Cl. 435-172.300.
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Bejnar, Walter. Sealed glass unit. 4,961,975, Cl. 428-34.000.
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Bell, Gary M., to Kapak Corporation. Tamper evident notched sealing envelope. 4,961,503, Cl. 206-627.000.
Bell, Weldon K.; Haag, Werner O.; and Marler, David O., to Mobil Oil Corp. Process for preparing ethers. 4,962,239, Cl. 568-697.000.
Beloit Corporation: *See*—
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Belt, Roger F.; and Uhrin, Robert, to Litton Systems, Inc. Epitaxial superconducting scructure on lattice matched lanthanum orthogallate. 4,962,087, Cl. 505-1.000.
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Berg, Marvin I.; Mihail, Stavros; and Oman, John E., to Promation Incorporated. Container filling system. 4,961,446, Cl. 141-144.000.
Berger, Joseph: *See*—
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Bergey, James L.: *See*—
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Berke, Joseph J.: *See*—
Muller, George H., 4,961,421, Cl. 606-180.000.
Bernard, Samuel D. Transportable weather resistant building enclosure. 4,961,297, Cl. 52-93.000.
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Schrammli, Fortunat; Berner, Markus; and Ott, Hans, 4,961,646, Cl. 356-328.000.
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Beswick, John M., to SKF Industrial Trading & Development Co. B.V. Steel with a composition of iron, carbon, silicon, phosphorus and molybdenum. 4,961,904, Cl. 420-123.000.
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Biggar, R. Warren, to Frost Products Limited. Dispensing cabinet for strip material. 4,961,613, Cl. 312-38.000.

Bigolin, Giuseppe. Comfortable use bicycle saddle. 4,961,609, Cl. 297-214.000.

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Bingham, Russell D.: *See*—
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Black, Graham, to Cannondale Corporation. Cycling pants. 4,961,233, Cl. 2-228.000.

Black, Laura E.; and Schucker, Robert C., to Exxon Research and Engineering Company. Selective separation of multi-ring aromatic hydrocarbons from distillates by perstraction. 4,962,271, Cl. 585-819.000.

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Blank, Richard E.: *See*—
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Blazek, William S., to PCC Airfoils, Inc. Method of making an improved turbine engine component. 4,961,459, Cl. 164-122.100.

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Blevins, Charles H.; Greene, George H.; Matlock, Paul L.; and Murphy, Gerald J., to Union Carbide Chemicals and Plastics Company Inc. Silicone polyether copolymers and polyurethane foams prepared therefrom. 4,962,218, Cl. 556-445.000.

Blind, Barbara: *See*—
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Bloh, Will, to Cetus Corportion. Ribotoxin conjugates. 4,9.. 189, Cl. 530-391.000.

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Blum, Helmut; and Hemmann, Siglinde, to Henkel Kommanditgesellschaft auf Aktien. Olefinic diphosphonic acids, a process for their production, their use as thresholders, and complexing compositions containing them. 4,962,229, Cl. 562-21.000.

Blumenfeld, Mark L.: *See*—
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Board of Governors of Wayne State University: *See*—
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Boateng, Daniel A. D., to Comino Ltd. Process for the manufacture of copper arsenate. 4,961,909, Cl. 423-87.000.

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Bodicky, Raymond O.; Crouther, Ronald; Forney, LeRoy S.; and Serowski, Andrew, to Sherwood Medical Company. Angiographic catheter with balanced dye injection openings. 4,961,731, Cl. 604-264.000.

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Boehlke, Klaus: *See*—
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Bogard, William T.; Bohm, George J.; Ciaramitaro, William; Palusamy, Sam S.; Singleton, Norman R.; and Tgortorice, John A., to Westinghouse Electric Corp. Reactor internals and core support monitoring system. 4,961,898, Cl. 376-245.000.

Bohm, George J.: *See*—
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Bohrer, Mark W., to Advanced Micro Devices, Inc. Segmented waveform generator. 4,962,344, Cl. 307-260.000.

Boinot, Francois; and Cousin, Michel, to Norsolor. Manufacture of creep-free prepregs based on phenolic resins. 4,962,166, Cl. 525-506.000.

Boissonneault, Roger M., to Warner-Lambert Company. Graduated estrogen contraceptive. 4,962,098, Cl. 514-170.000.

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Bolzoni, Piergiovanni; and Cutrone, Marino A., to Cubotex S.r.l. Apparatus for dyeing and bleaching yarns and textile products in general. 4,961,327, Cl. 68-27.000.

Bonar Inc.: *See*—
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Bonne, Ulrich. Flowmeter fluid composition correction. 4,961,348, Cl. 73-861.020.

Bonomelli, Federico. Process and apparatus for the continuous manufacture of filter paper bags for infusions, provided with thread and tag. 4,961,301, Cl. 53-413.000.

Bonuchi, James A.: *See*—
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Boomgaard, Dirk J.: *See*—
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Boone, Daniel E., to IDL, Inc. Method for determining permeability in hydrocarbon wells. 4,961,343, Cl. 73-152.000.

Booth Barrett L.: *See*—
Daggett, Kenneth E.; Onaga, Eimei M.; Casler, Richard J., Jr.; Booth Barrett L.; and Jalbert, Vincent P., 4,962,338, Cl. 318-568.110.

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Borden, Inc.: *See*—
Detlefsen, William D.; Phillips, Earl K.; and Norton, Richard V., 4,961,795, Cl. 156-62.200.

Bormans, Bernardus J. M.; and Bakker, Johan G., to U.S. Philips Corporation. Charged particle apparatus comprising a beam discriminator. 4,962,308, Cl. 250-396.00R.

Born, W. Stanley: *See*—
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Borriello, John. Off-center cap-level magnetic float sewer alarm. 4,962,370, Cl. 340-623.000.

Bortnick, Newman M.; and Lin, Long-Jin, to Rohm and Haas Company. Process for making silicone particles. 4,962,165, Cl. 525-479.000.

Boschelli, Diane H.; Connor, David T.; Flynn, Daniel L.; Sircar, Jagadish C.; and Hoefle, Milton L., to Warner-Lambert Company. Triazole derivatives of fenamates as antiinflammatory agents. 4,962,119, Cl. 514-384.000.

Bost, Michel; and Chasson, Alain, to Aerospatiale Societe Nationale Industrielle. Fastening device including sleeves, and rotor blade equipped with such a device for fastening to a hub. 4,961,687, Cl. 416-230.000.

Bothast, Rodney J.: *See*—
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Boyd, Frank M., Sr.; and Boyd, Francis M., Jr., to F. Boyd, Ltd., Limited Partnership. Fixed yet pivotable knife or tool. 4,961,239, Cl. 7-118.000.

Boyer, Jean-Francois, to Ethypharm. Method of preparing comtrolled release fenofibrate. 4,961,890, Cl. 264-113.000.

Braden, Rudolf: *See*—
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Braeken, Jozef; Dekerk, Jean-Paul; van der Poel, Hendrik; Verborgt, Jozef; and Haak, Peter, to Labofina, S.A. Self polishing anti-fouling paints. 4,962,135, Cl. 523-122.000.

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Braxmeier, Hans, to Stahlecker, Hans; and Stahlecker, Fritz. Machine for pneumatic false-twist spinning. 4,961,308, Cl. 57-328.000.
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Breeden, Robert L.: *See—*
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Bretz, Philip E.: *See—*
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Bridges, Alexander J., to Warner-Lambert Company. Method of preparing 51,N6-disubstituted adenosines from inosines. 4,962,194, Cl. 536-26.000.
Brienza, Anthony R., to Westinghouse Electric Corp. Radial seal. 4,961,588, Cl. 277-148.000.
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British Telecommunications public limited company: *See—*
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British United Shoe Machinery Ltd.: *See—*
Schuurmans, Marinus E., 4,961,240, Cl. 12-12.500.
Brochier, Jose , to Spie Batignolles. Process for the cultivation of aquatic plants, the resulting plants, and their uses. 4,961,774, Cl. 71-77.000.
Brooke, Arthur W., Jr., to United Technologies Corporation. Stress-free composite and a method of and arrangement for manufacturing the same. 4,961,771, Cl. 65-18.300.
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Brown, Paul E., to Liquid Molding Systems, Inc. Liquid silicone molding process. 4,961,888, Cl. 264-40.600.
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Brown, William D.; and Khaliq, Muhammad A., to University of Arkansas, The. Annealing process to stabilize PECVD silicon nitride for application as the gate dielectric in MOS devices. 4,962,065, Cl. 437-242.000.
Brown & Williamson Tobacco Corporation: *See—*
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Sprecker, Mark A.; Belko, Robert P.; Brucato, Salvatore M.; Beck, Charles E. J.; and Hanna, Marie R., 4,962,090, Cl. 512-9.000.
Bruke, Richard, to Spirac Engineering AB. Separating device. 4,961,864, Cl. 210-791.000.
Brun, Pierre, to Compagnie Europeene du Zirconium Cezus. Process and apparatus for pumping and metering a liquid product with a melting point between 200 and 350 degrees C. 4,961,688, Cl. 417-92.000.
Bruning, Paul; Mackel, Wilfried; Wrede, Ulrich; and Niemerg, Willi, to Westfalia Separator AG. Centrifuge drum for clarifying or separating centrifugates. 4,961,723, Cl. 494-56.000.
Brun.o, Thomas J., to United States of America, Commerce. Method and apparatus for supercritical fluid extraction solution separation. 4,962,275, Cl. 585-834.000.
Bruttel, Beat; and Kvita, Petr, to Ciba-Geigy Corporation. Coated active substances: dye coated with polyethylene oxide-propylene oxide or with ethoxylated stearyldi phenyloxyethyl diethylenetriamine. 4,961,755, Cl. 8-526.000.
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Buckley, Richard A.; and Folk, Kenneth F., to AMP Incorporated. Tape wrapping apparatus for wrapping a bundle of wires. 4,961,815, Cl. 156-468.000.
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Bujalski, Duane R.; LeGrow, Gary E.; and Lim, Thomas F., to Dow Corning Corporation. Alkylpoly (polysilyl) azane preceramic polymers. 4,962,175, Cl. 528-19.000.
Bujalski, Duane R.; DeGrow, Gary E.; and Lim, Thomas F., to Dow Corning Corporation. Polysilane preceramic polymers. 4,962,176, Cl. 528-19.000.
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Burandt, Corliss O., to Investment Rarities Incorporated. Method and device for optimizing the air-fuel mixture burn rate of internal combustion engines during low speed, light and heavy load operating conditions. 4,961,406, Cl. 123-90.150.
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Burlock, Charleton D.; Lemmons, Gerald E.; and Williams, David W., to Dole Dried Fruit and Nut Company. Method for splitting closed shell pistachio nuts. 4,961,947, Cl. 426-482.000.
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Burns, Gary T.; Saha, Chandan K.; and Keller, Ronald J., to Dow Corning Corporation. Highly densified bodies from preceramic polysilazanes filled with silicon carbide powders. 4,962,069, Cl. 501-90.000.
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Burns, Robert V.; and Gupta, Sanjay, to Siemens Transmission Systems, Inc. Series ringing signal generator. 4,962,527, Cl. 379-418.000.
Burroughs, James R.; and O'Kain, Alan N., to Strategic Energy, Ltd. Flashlight with battery tester. 4,962,347, Cl. 320-48.000.
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Butler, David R.; Snow, George; Sandford, Philip; Neu, Max G.; Villani, Jean P.; Teyssedre, Alain; and Lenoir, Roland, to Foseco International Limited. Moulds for metal casting and sleeves containing filters for use therein. 4,961,460, Cl. 164-134.000.
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Byers, Larry L.; Scheuneman, James H.; and Desubijana, Joseba M., to Unisys Corporation. Bus data transmission verification system. 4,962,501, Cl. 371-51.100.
Byrne, John W., to Engelhard Corporation. Method for reduction of nitrogen oxides with ammonia using promoted zeolite catalysts. 4,961,917, Cl. 423-239.000.
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Cairns, John P., to Computer Security Corporation. System for cryptographing and identification. 4,962,530, Cl. 380-23.000.

Calavenna, Anthony M. Watch band buckle. 4,961,250, Cl. 24-178.000.
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Candore, Amedeo, to Morton Thiokol, Inc. High lamination speed automatic laminstor. 4,961,808, Cl. 156-264.000.
Canducci, Gian C., to Medtronic, Inc. Rate adaptive myoelectric pacer. 4,961,423, Cl. 128-419.0PG.
Cannata, Vincenzo; Tameriani, Giancarlo; and Morotti, Mauro, to Ministero dell'Universita e delle Ricerca Scientifica e Tecnologica. Process for the synthesis of the levodopa. 4,962,223, Cl. 558-408.000.
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Caron, Jean-Claude: *See—*
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Carpenter, Ronald A., to Ford Motor Company. Vehicle bumper system. 4,961,603, Cl. 293-102.000.
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Carre, Jean-Jacques, to Bendix France. Assisted hydraulic braking system and booster and control valve designed for such a system. 4,961,318, Cl. 60-579.000.
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Caskey, Terrence L.; Jorgensen, Janine L.; and Trimmer, Johnny L., to Dow Chemical Company, The. Hollow fiber membrane fluid separation device adapted for boreside feed. 4,961,760, Cl. 35-158.000.
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Centre International De Recherches Dermatolociques: *See—*
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Frankel, Arthur E., 4,962,188, Cl. 530-389.000.
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Sakai, Izumi; Donaldson, Gabriel; and Chilton, Nicholas J., 4,961,643, Cl. 356-28.000.

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Xu, Changxiang; Yu, Oiulin; and Zhuo, Ruixing, 4,961,268, Cl. 33-568.000.

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Yoshida, Naoyuki; Kaneoya, Masakazu; Uchida, Manabu; and Morita, Hiroshi, 4,962,031, Cl. 435-280.000.

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Rioja, Roberto J.; Cho, Alex; and Bretz, Philip E., 4,961,792, Cl. 148-12.70A.

Cho, George E.; and Furumoto, Horace, to Candela Laser Corporation. Endoscope with tapered shaft. 4,961,414, Cl. 128-7.000.

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Rosen, Terry J.; and Chu, Daniel T., 4,962,112, Cl. 514-300.000.

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Bruttel, Beat; and Kvita, Petr, 4,961,755, Cl. 8-526.000.
Drabek, Jozef, 4,962,126, Cl. 514-587.000.
Harisiades, Paul, 4,962,178, Cl. 528-33.000.
Hoppe, Thomas, 4,961,282, Cl. 43-114.000.
Hungerbuhler, Ernst; and Kalvoda, Jaroslav, 4,962,196, Cl. 540-357.000.
Ksander, Gary M.; and Zimmerman, Mark B., 4,962,105, Cl. 514-212.000.
Puntener, Alois; and Burdeska, Kurt, 4,962,191, Cl. 534-698.000.
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Kato, Yoshiaki; Yuyama, Harumi; Ojima, Tutomu; and Ishikawa, Hiromi, 4,962,485, Cl. 365-229.000.

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Fujita-Yamaguchi, Yoko; McDonald, Jay M.; and Sacks, David B., 4,962,155, Cl. 525-54.100.

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Ostrup, Heinrich; and Sanders, Lambert, 4,961,305, Cl. 56-98.000.

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Lapray, Danny K., 4,961,400, Cl. 119-3.000.

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Close, Leo R., to Marcia Israel. Merchandise security system utilizing RF transmitter. 4,962,369, Cl. 340-572.000.

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Coast, John B., 4,961,395, Cl. 114-270.000.

Coates, William J.: *See—*
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Coca-Cola Company, The: *See—*
Credle, William S., Jr.; Ziesel, Lawrence B.; and Heflin, Mark S., 4,961,447, Cl. 141-1.000.
Stembridge, William F.; Sturrock, James C.; and Stembridge, W. Frank, 4,961,456, Cl. 141-1.000.

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Codman & Shurtleff, Inc.: *See—*
Kees, George, Jr.; Worrick, Charles B., III; and Santangelo, John A., 4,961,743, Cl. 606-158.000.

Coffman, Randall R., to Norman Dryer Company, Inc. Seal system for dryer. 4,961,274, Cl. 34-133.000.

Cohrs, William E.: *See—*
Pollock, Douglas K.; McDonald, Charles J.; Cohrs, William E.; and Reno, John M., 4,962,154, Cl. 525-54.100.

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Cole, Ronald E., to Emhart Industries, Inc. Timer with improved electrical bussing. 4,962,288, Cl. 200-38.00R.

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Oat, Henry C., 4,962,006, Cl. 428-703.000.

Colyer, E. Keith; O'Connor, Joseph G.; and Hammann, W. A., IV, to Mead Corporation, The. Method for producing amino-formaldehyde

microcapsules and photosensitive microcapsules produced thereby. 4,962,010, Cl. 430-138.000.

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Comar, Inc.: *See*—
Eppler, Susan G.; and Moorehead, Robert M., 4,962,538, Cl. 382-1.000.

Combest, John F., to Kuss Corporation. In-tank fuel filter. 4,961,850, Cl. 210-232.000.

Comino Ltd.: *See*—
Boateng, Daniel A. D., 4,961,909, Cl. 423-87.000.

Commercial Resins Company: *See*—
Hart, Milburn L.; and Carlson, Ronald E., Sr., 4,961,798, Cl. 156-86.000.

Commissariat a l'Esergie Atomique: *See*—
Aubert, Jean-Jacques; Lejus, Anne-Marie; Viana, Bruno; and Vivien, Daniel, 4,962,504, Cl. 372-41.000.

Compagnie Europeene du Zirconium Cezus: *See*—
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Compagnie Generale Des Etablissements Michelin-Michelin & Cie: *See*—
Durif, Pierre, 4,961,453, Cl. 152-379.300.

Competition Cams, Inc.: *See*—
McWhirter, John A., 4,961,407, Cl. 123-90.410.

Compton, Lawrence T. Wood jointer and planer blade sharpening holder. 4,961,287, Cl. 51-74.0BS.

Computer Security Corporation: *See*—
Cairns, John P., 4,962,530, Cl. 380-23.000.

Conlab, Inc.: *See*—
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Conlon, Anastasia M.: *See*—
Wing-Keung Lau, John; and Conlon, Anastasia M., 4,962,068, Cl. 501-49.000.

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Case, Douglas R.; and Conner, Watson M., 4,962,451, Cl. 364-900.000.

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Boschelli, Diane H.; Connor, David T.; Flynn, Daniel L.; Sircar, Jagadish C.; and Hoefle, Milton L., 4,962,119, Cl. 514-384.000.

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Cook, Paul P. Textile processing employing a stretching technique. 4,961,307, Cl. 57-310.000.

Cooper Industries, Inc.: *See*—
Dodd, Peter G.; and MacNeil, Stephen G., 4,962,336, Cl. 315-290.000.
Morgan, Ian H.; and McAvoy, Sean, 4,961,444, Cl. 137-315.000.
Stewart, John F., 4,961,675, Cl. 408-1.00R.

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Corbo, Thomas A.; Vulpitta, Brian A.; Greenleaf, Alan R.; and Kicak, Richard J., Jr., to Manco, Inc. Reuseable tape dispenser. 4,961,525, Cl. 225-65.000.

Corke, Andrew; and Johansson, Lennart, to BT Industries Aktiebolag. Controlled electric pump drive for hydraulic lifting arrangement with gas spring in motor. 4,961,316, Cl. 60-431.000.

Corley, Larry S., to Shell Oil Company. Epoxidized fatty acid ester compositions. 4,962,179, Cl. 528-90.000.

Cornelissen, Bernardus H. J., to U.S. Philips Corporation. High speed digital carry look ahead circuit for parallel adder. 4,962,471, Cl. 364-787.000.

Cornie, James A.: *See*—
Klier, Eric; Mortensen, Andreas; Cornie, James A.; and Flemings, Merton C., 4,961,461, Cl. 164-461.000.

Corning Incorporated: *See*—
Carre, Alain R. E.; and Roger, Francoise M. M., 4,961,996, Cl. 428-421.000.
Schermerhorn, Paul M.; Teter, Michael P.; and Vanderwoestine, Robert V., 4,961,767, Cl. 65-2.000.

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Coulombe, Maurice. Medical dispenser tray. 4,961,500, Cl. 206-366.000.

Coulter Electronics, Inc.: *See*—
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Courter, Barbara G. J.: *See*—
Adams, William; DellaRovere, R. H.; and Courter, Barbara G. J., 4,961,548, Cl. 244-118.500.

Courtney, Spencer R.: *See*—
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Cousin, Michel: *See*—
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Coutts, Garry D.; Lautenschlager, Eugene P.; Wixson, Richard L.; and Novak, Michael A., to DHD Medical Products. Orthopedic cement mixer. 4,961,647, Cl. 366-139.000.

Covarrubias, Jesse: *See*—
House, Randall; Covarrubias, Jesse; Hofmann, JoHann H.; and Powell, Jerry, 4,961,293, Cl. 52-21.000.

Crafts, Harold S.; and Moll, Maurice M., to NCR Corporation. Current limiting output driver. 4,962,345, Cl. 307-270.000.

Crain, Lawrence, to ITT Corporation. Emergency action systems including console and security monitoring apparatus. 4,962,473, Cl. 364-900.000.

Crawford, David R.: *See*—
Criscione, Frank J., II; Bonuchi, James A.; and Crawford, David R., 4,961,248, Cl. 17-11.200.

Crawford, Joe T. Flying target with marker. 4,961,585, Cl. 273-363.000.

Cray Research, Inc.: *See*—
Eberlein, Delvin D.; and Wehner, Peter, 4,962,356, Cl. 324-158.00F.

Credle, William S., Jr.; Ziesel, Lawrence B.; and Heflin, Mark S., to Coca-Cola Company, The. Automatic beverge dispensing system. 4,961,447, Cl. 141-1.000.

Creed, Brian T., to Eaton Corporation. Express window lift motor shutdown. 4,962,337, Cl. 318-280.000.

Crespin, Jean-Pierre; and Saulay, Frederic, to Polinorsud. Dynamic containment device. 4,961,442, Cl. 137-312.000.

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Criscione, Frank J., II; Bonuchi, James A.; and Crawford, David R., to Johnson Food Equipment, Inc. Scalder apparatus. 4,961,248, Cl. 17-11.200.

Cronin, John E.; and Lee, Pei-ing P., to International Business Machines Corporation. Process for fabricating multi-level integrated circuit wiring structure from a single metal deposit. 4,962,058, Cl. 437-187.000.

Crosby, Thomas G., to Bunge Foods Corporation. Pourable shortening containing butter and method for preparing. 4,961,951, Cl. 426-602.000.

Crossno, Patricia J.; Mendelsohn, Gary H.; and Hedberg, William F., to Digital Equipment Corporation. Video imaging device with image altering controls and related method. 4,962,463, Cl. 364-518.000.

Crosswhite, Lola E.: *See*—
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Crouther, Ronald: *See*—
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Crowell, James M., to Pyro Mining Company. Multi-function control actuating mechanism. 4,961,468, Cl. 173-39.000.

Crumpler, Michael G.; Barker, George W., III; Smith, Darrell L.; Posey, Willard W.; Shepard, Howard S.; and Campbell, Steven R., to Southwire Company. Batch control system and process for insulating a metallic rod. 4,961,887, Cl. 264-40.400.

Cubotex S.r.l.: *See*—
Bolzoni, Piergiovanni; and Cutrone, Marino A., 4,961,327, Cl. 68-27.000.

Cuervo, Julio H.; and Houghten, Richard A., to Scripps Clinic and Research Foundation. Deletion analogues of magainin peptides. 4,962,277, Cl. 514-14.000.

Cullo, Leonard A.; and Restelli, Edward F., Jr., to Aristech Chemical Corporation. Treatment of arsine removal catalysts. 4,962,272, Cl. 585-826.000.

Cummings, Carl S.: *See*—
Anderson, Charles D.; Cummings, Carl S.; and Hudson, J. Richard, 4,962,279, Cl. 501-150.000.

Cunard, Joel C., to Hedstrom Corp. Play gym hinge guard. 4,961,558, Cl. 248-370.000.

Curran Company, The: *See*—
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Currier, Glenn. Bulk paint containers and method of making same. 4,961,509, Cl. 220-5.00A.

Cutrone, Marino A.: *See*—
Bolzoni, Piergiovanni; and Cutrone, Marino A., 4,961,327, Cl. 68-27.000.

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Welch, John T.; and Cynamon, Michael H., 4,962,111, Cl. 514-255.000.

Daggett, Kenneth E.; Onaga, Eimei M.; Casler, Richard J., Jr.; Booth Barrett L.; and Jalbert, Vincent P., to Staubli International AG. Universal robot control board configuration. 4,962,338, Cl. 318-568.110.

Dahl, Anders: *See*—
Norell, Maria; Dahl, Anders; and Soderberg, Ursula, 4,961,918, Cl. 423-479.000.

Dahlgren, Harvey W., to Epic Products International Corp. Method for coating a web with wet ink thereon. 4,961,964, Cl. 427-211.000.

Dahlgren, Victor F.: *See*—
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Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Shoji, Iwao; and Okushita, Masataka, 4,961,518, Cl. 222-107.000.

Daido Tokuhuko Kabushiki Kaisha: *See*—
Fujita, Senji; and Demukai, Noboru, 4,962,291, Cl. 219-10.491.

Daido, Toshihiko; Matsuoka, Hirofumi; and Tabuse, Hidetoshi, to Koyo Seiko Co., Ltd. Steering angle middle point detecting apparatus. 4,961,474, Cl. 180-79.100.

Daifuku Company, Ltd.: *See*—
Sakamoto, Shunji; Usui, Junichi; and Oda, Haruo, 4,961,257, Cl. 29-823.000.

Daiichi Seiyaku Co., Ltd.: *See*—
Sato, Makoto; Takemura, Makoto; Higashi, Kunio; Soga, Tsunehiko; Matsumoto, Hiroo; and Nishi, Toshiyuki, 4,962,202, Cl. 546-112.000.
Daikin Industries, Ltd.: *See*—
Shinjo, Masayoshi; Okamoto, Sumiko; Katakura, Yasuko; and Takubo, Seiji, 4,962,156, Cl. 525-100.000.
Tatemoto, Masayoshi; Yutani, Yuji; and Fujiwara, Koji, 4,962,236, Cl. 568-615.000.
Dainippon Ink & Chemicals, Inc.: *See*—
Hashimoto, Yutaka; Yumoto, Masanobu; Umaba, Toshihiko; Kamada, Yutaka; Matsubara, Tsutomu; and Kawaguchi, Sigeo, 4,961,976, Cl. 428-34.600.
Takeuchi, Kiyohumi; Sasaki, Makoto; and Takatsu, Haruyoshi, 4,961,874, Cl. 252-299.600.
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Ahmed, Salah H.; and Luksas, Anthony J., 4,961,950, Cl. 426-581.000.
Dalton, Raymond F.; and Burgess, Arthur, to Imperial Chemical Industries PLC. Solvent extraction process. 4,961,856, Cl. 210-681.000.
Danbom, Jan: *See*—
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Aoki, Shinji; and Maezawa, Akihiko, 4,961,830, Cl. 204-157.300.
Eberlein, Delvin D.; and Wehner, Peter, to Cray Research, Inc. Integrated circuit test socket. 4,962,356, Cl. 324-158.00F.
ECC America Inc.: *See—*
Anderson, Charles D.; Cummings, Carl S.; and Hudson, J. Richard, 4,962,279, Cl. 501-150.000.
Eckart, Manfred: *See—*
Guhne, Wieland; Ahlf, Heinz-Jurgen; and Eckart, Manfred, 4,961,765, Cl. 55-367.000.
Eckman, Ronald E. Adjustable metered dispenser. 4,961,521, Cl. 222-142.500.
Eckstein, Mark H.; and Lutz, Michael A., to Dow Corning Corporation. Method of controlling flow by a radiation formed dam. 4,961,886, Cl. 264-22.000.
EconoFab, Inc.: *See—*
Waldrop, James L., 4,961,691, Cl. 417-237.000.
Edwards, Arthur J., to Motorola, Inc. Switched filter with low offset. 4,962,348, Cl. 322-58.000.
Edwards, Jack L.: *See—*
Smith, Dwight; and Edwards, Jack L., 4,961,790, Cl. 106-315.000.
Egan, Edward J., Jr., to West Coast Container. Glass holder. 4,961,555, Cl. 248-231.800.
Eggers, Michael E.; and Merchant, Abid N., to Du Pont de Nemours, E. I., and Company. Ternary azeotropic compositions of 2,3-dichloro-1,1,1,3,3-pentafluoropropane with trans-1,2-dichloroethylene and methanol. 4,961,869, Cl. 252-170.000.
Eisai Co., Ltd.: *See—*
Kogure, Yoshio, 4,961,927, Cl. 424-94.300.
Eisenhaure, David B.: *See—*
Downer, James R.; Eisenhaure, David B.; Hockney, Richard L.; and Johnson, Bruce G., 4,961,352, Cl. 74-5.460.
Eissele, Ernest M.; Rogers, Edward S.; and Reidies, Arno H., to Carus Corporation. Method of bleaching dyed cotton garments. 4,961,751, Cl. 8-111.000.
Eka Nobel AB: *See—*
Andersson, Kjell R.; Larsson, Bernt; Thoresson, Hans-Olof; and Larsson, Bo V., 4,961,825, Cl. 162-175.000.
Norell, Maria; Dahl, Anders; and Soderberg, Ursula, 4,961,918, Cl. 423-479.000.
Ekholm, Rolf; Hillstrom, Rune; and Palsson, Daniel, to Kamyr AB. Apparatus for separating a suspension of fibrous cellulose pulp. 4,961,844, Cl. 209-273.000.
Eklund, Robert H.: *See—*
Havemann, Robert H.; and Eklund, Robert H., 4,962,365, Cl. 338-306.000.
Elecsys Ltd.: *See—*
Avrahami, Zohar; Larom, Dov; Zucker, Shlomo; and Gross, Joseph, 4,961,885, Cl. 261-142.000.
Eli Lilly and Company: *See—*
Gajewski, Robert P., 4,962,284, Cl. 564-194.000.
Ellett, James R., to Bralorne Resources Limited. Two way latching trip valve. 4,961,560, Cl. 251-63.500.
Ellis, William O.: *See—*
Henning, Thomas P.; and Ellis, William O., 4,961,337, Cl. 72-426.000.
Elopak Systems A.G.: *See—*
Risko, Frank D.; and Lewis, Thomas D., 4,961,490, Cl. 198-433.000.
Elsheikh, Maher Y., to Atochem North America, Inc. Process for producing 1,1-dichloro-1-fluoroethane and/or 1-chloro-1,1-difluoroethane free of vinylidene chloride. 4,962,244, Cl. 570-165.000.
Eltech Systems Corporation: *See—*
Ciere, Thomas M.; Abbaschian, Gholamreza J.; Wheeler, Douglas J.; and Barnes, Albert L., 4,961,902, Cl. 419-12.000.
Emhart Industries, Inc.: *See—*
Cole, Ronald E., 4,962,288, Cl. 200-38.00R.
Emmett, John C.; and Coates, William J., to Smith Kline & French Laboratories Limited. Pyridazinone derivatives. 4,962,110, Cl. 514-252.000.
Emslander, Jeffrey O.; Larson, Curtis L.; and Lepere, Pierre H., to Minnesota Mining and Manufacturing Company. Microwave absorbing composite. 4,962,000, Cl. 428-461.000.
Enari, Hiroyuki; Kumazawa, Satoru; Shimizu, Susumu; Ito, Atsushi; Sato, Nobuo; and Saishojo, Toshihide, to Kureha Kagaku Kogyo Kabushiki Kaisha. Novel azole derivative and agricultural/horticultural fungicide containing said derivative as active ingredient. 4,962,278, Cl. 514-399.000.
Endler, Wolfgang: *See—*
Weiler, Rolf; and Endler, Wolfgang, 4,961,480, Cl. 188-73.440.
Endo, Hiroyuki: *See—*
Satake, Yoshikatsu; Yamamoto, Shinji; Kaneko, Takashi; Tada, Masahito; Kashiwadate, Ken; Mizuno, Toshiya; Endo, Hiroyuki; Katto, Takayuki; and Shiiki, Zenya, 4,962,143, Cl. 524-100.000.
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Eng, Melvin D.: *See—*
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Engel, Aloysius: *See—*
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Leonhartsberger, Heinrich, 4,961,372, Cl. 92-108.000.
Engelberger, Joseph F.: *See—*
Pong, William; Engelberger, Joseph F.; Evans, John M.; and Kazman, William S., 4,962,453, Cl. 364-424.020.
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Byrne, John W., 4,961,917, Cl. 423-239.000.
Fekete, Imre, deceased, 4,962,462, Cl. 364-492.000.
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Tijburg, Ivo I. M.; and Geus, John W., 4,962,280, Cl. 502-439.000.
Enstrom, Edward: *See—*
Balow, Frank A.; Enstrom, Edward; and Skiper, Eugene, r., 4,961,378, Cl. 101-142.000.
Envirex Inc.: *See—*
Wittmann, John W.; Thiel, Donald J.; and Smith, George W., 4,961,854, Cl. 210-621.000.
Enzyme Bio-Systems, Ltd.: *See—*
Keng, Jiun G., 4,962,026, Cl. 435-98.000.
Epic Products International Corp.: *See—*
Dahlgren, Harvey W., 4,961,964, Cl. 427-211.000.
Epler, John E.; and Treat, David W., to Xerox Corporation. Method of in situ photo induced evaporation enhancement of compound thin films during or after epitaxial growth. 4,962,057, Cl. 437-81.000.
Eppendorf-Netheler-Hinz GmbH, Firma: *See—*
Gerken, Hero, 4,961,351, Cl. 73-864.650.
Tennstedt, Ernst, 4,961,350, Cl. 73-864.010.

Eppler, Susan G.; and Moorehead, Robert M., to Comar, Inc. Image analysis counting system. 4,962,538, Cl. 382-1.000.
Eppstein, Deborah A.; and Schryver, Brian B., to Syntex (U.S.A.) Inc. Controlled release of macromolecular polypeptides. 4,962,091, Cl. 514-2.000.
Eriez Manufacturing Company: *See*—
Falconer, Thomas H., 4,961,491, Cl. 198-761.000.
Ernst Leitz Wetzlar GmbH: *See*—
Gaul, Norbert; Reinheimer, Guenter; and Weimar, Peter, 4,961,636, Cl. 350-520.000.
Ervin, Robert D.: *See*—
Chen, Kan; and Ervin, Robert D., 4,962,457, Cl. 364-443.000.
Ethicon, Inc.: *See*—
Kalinski, Robert J.; Cerwin, Robert J.; and Alpern, Marvin, 4,961,498, Cl. 206-339.000.
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Boyer, Jean-Francois, 4,961,890, Cl. 264-113.000.
Eurofloor, S.A.: *See*—
Valenduc, Gerard, 4,961,980, Cl. 428-67.000.
Evans, John M.: *See*—
Pong, William; Engelberger, Joseph F.; Evans, John M.; and Kazman, William S., 4,962,453, Cl. 364-424.020.
Evans, Walter R., to Sargent & Greenleaf, Inc. High security panic exit system. 4,961,330, Cl. 292-21.000.
Evaporating Apparel Industries: *See*—
Siciliano, Anthony A., 4,961,735, Cl. 604-378.000.
Everhart, Timothy L.: *See*—
Points, Dale E.; and Everhart, Timothy L., 4,961,600, Cl. 292-25.000.
Everts, Rudi: *See*—
Van Den Akker, Hendrikus E. A.; Everts, Rudi; Woudstra, Jouke J.; Barnes, Peter H.; Verheul, Cornelis M.; and Dirkse, Hendrik A., 4,961,863, Cl. 210-788.000.
Expert System Technologies, Inc., The: *See*—
Salvado, Carlos A.; and Wade, Bruce E., 4,961,346, Cl. 73-644.000.
Exxon Research and Engineering Company: *See*—
Behrmann, William C.; Mauldin, Charles H.; and Arcuri, Kym B., 4,962,078, Cl. 502-325.000.
Bhagat, Phiroz M.; and Koros, Robert M., 4,961,882, Cl. 261-124.000.
Black, Laura E.; and Schucker, Robert C., 4,962,271, Cl. 585-819.000.
Feimer, Joseph L.; Schucker, Robert C.; and Darnell, Charles P., 4,962,270, Cl. 585-819.000.
Helbert, Thomas R.; Chianelli, Russell R.; Stiefel, Edward I.; and Jacobson, Allan J., 4,962,077, Cl. 502-220.000.
Ho, W. S. Winston; Sartori, Guido; and Stogryn, Eugene L., 4,961,873, Cl. 252-189.000.
Murphy, William J., 4,961,836, Cl. 208-111.000.
Wolfe, Ralph G.; Maloney, Dennis P.; Steele, Robert E.; Tsonopoulos, Constantine; and Thomas, Eugene R., 4,962,238, Cl. 568-621.000.
F. Boyd, Ltd., Limited Partnership: *See*—
Boyd, Frank M., Sr.; and Boyd, Francis M., Jr., 4,961,239, Cl. 7-118.000.
Fabian, Miklos: *See*—
Nikias, Chrysostomos L.; Brooks, Dana H.; Siegel, John H.; and Fabian, Miklos, 4,961,428, Cl. 128-699.000.
Fadem, Richard J., to NCR Corporation. Multi-user serial bus system. 4,962,378, Cl. 340-825.500.
Faggin, Federico: *See*—
Mead, Carver A.; Allen, Timothy P.; and Faggin, Federico, 4,962,342, Cl. 307-201.000.
Faillace, Nicholas J., to Westinghouse Electric Corp. Extraction tool. 4,961,256, Cl. 29-764.000.
Fairchild Industries, Inc.: *See*—
Kern, Frederick C., 4,961,702, Cl. 425-595.000.
Falconer, Thomas H., to Eriez Manufacturing Company. Three mass vibratory feeder. 4,961,491, Cl. 198-761.000.
Falling, Stephen N.; and Gustafson, Bruce L., to Eastman Kodak Company. Process for the preparation of high-purity tetrahydrofuran. 4,962,210, Cl. 549-429.000.
Fansler, David V.: *See*—
Knesel, Ernest A., Jr.; Shoemaker, Daniel R.; and Fansler, David V., 4,962,044, Cl. 436-177.000.
Fanuc Ltd.: *See*—
Matsuura, Hitoshi, 4,962,460, Cl. 364-474.030.
Seki, Masaki; Takegahara, Takashi; and Yamaki, Katsunobu, 4,962,472, Cl. 364-900.000.
Yamamura, Masato, 4,961,696, Cl. 425-149.000.
Farace, Louis P.: *See*—
Bai, Monty W.; Farace, Louis P.; and Titus, John D., 4,961,382, Cl. 102-476.000.
Farley, Inc.: *See*—
Downing, Robert E., 4,961,458, Cl. 164-72.000.
Farnaam, Mohammad: *See*—
Sliwa, Jack; Farnaam, Mohammad; Dixit, Pankaj; and Shen, Lewis N., 4,962,060, Cl. 437-192.000.
Farohani, Mohammed M.: *See*—
Liou, Fu-Tai; Miller, Robert O.; Farohani, Mohammed M.; and Han, Yu-Pin, 4,962,414, Cl. 357-71.000.
Farrar, David: *See*—
Allen, Adrian S.; Farrar, David; and Flesher, Peter, 4,962,172, Cl. 526-318.420.
Farzin-Nia, Farrokh: *See*—
Reher, James F.; and Farzin-Nia, Farrokh, 4,961,782, Cl. 75-246.000.
Fauconet, Michel: *See*—
Delavarenne, Serge; Fauconet, Michel; Simon, Michel; and Sommer, Jean, 4,962,232, Cl. 562-851.000.
Faurenhoff, Erv, to Norco Industries, Inc. Trailer tongue alignment. 4,961,589, Cl. 280-475.000.
Faust, Steven M.: *See*—
Cherukuri, Subraman R.; Orlandi, Daniel A.; Faust, Steven M.; and Zamudio-Tena, J. Francisco, 4,961,935, Cl. 426-3.000.
Fay, John M., to Hull Corporation. Method and means for assuring freeze dryer chamber sterility. 4,961,273, Cl. 34-92.000.
Fearnot, Neal E.: *See*—
Marchosky, J. Alexander; Moran, Christopher J.; and Fearnot, Neal E., 4,961,422, Cl. 128-401.000.
Feemster, James A.: *See*—
Fulton, Alfred L.; Smallwood, William L.; and Feemster, James A., 4,962,393, Cl. 346-150.000.
Feimer, Joseph L.; Schucker, Robert C.; and Darnell, Charles P., to Exxon Research and Engineering Company. Multi-stage pervaporation process run at progressively higher vacuum, higher temperature or both at each successive retentate stage. 4,962,270, Cl. 585-819.000.
Fekete, Anna M., Administratrix: *See*—
Fekete, Imre, deceased, 4,962,462, Cl. 364-492.000.
Fekete, Imre, deceased (by Fekete, Anna M., Administratrix), to Engelhard Corporation. Fuel cell/battery hybrid system. 4,962,462, Cl. 364-492.000.
Feldner, Kurt: *See*—
Degen, Bruno; and Feldner, Kurt, 4,961,861, Cl. 210-717.000.
Ferenc, James J.; Goke, Louis R.; Grimes, Gary J.; and Moffitt, Bryan S., to AT&T Bell Laboratories. Building-block architecture of a multi-node circuit-and packet-switching system. 4,962,497, Cl. 370-60.100.
Ferrari, Claudio; and Caselli, Oreste, to Barilla G.E.R. F.LII-Societa per Azoni. Machine for thermally treating and sterilizing pre-packaged food articles by means of microwaves. 4,962,298, Cl. 219-10.55A.
Ferri, James; and Samurin, Norman A., to Dresser-Rand Company. Compressor cartridge seal and insertion method. 4,961,260, Cl. 29-888.025.
Fetta, Jeffrey E.: *See*—
Ryer, Richard N., II; and Fetta, Jeffrey E., 4,961,546, Cl. 242-154.000.
Fialla, Peter, to Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft. Process for the production of aromatic polyesters. 4,962,180, Cl. 528-176.000.
Filipek, Pauline A.: *See*—
Kennedy, David N.; Filipek, Pauline A.; and Caviness, Verne S., Jr., 4,961,425, Cl. 128-653.000.
Fischer, Karl: *See*—
Bayer, Ernst; and Fischer, Karl, 4,962,436, Cl. 360-96.300.
Zimmerling, Dieter; Schmidt, Johannes E.; Seubert, Rolf; Fischer, Karl; and Sauer, Friedrich, 4,961,827, Cl. 203-87.000.
Fisher Scientific Company: *See*—
Andersen, Marlo R.; Tiffany, Thomas O.; and Gangitano, Mario J., 4,961,906, Cl. 422-102.000.
Fishman, Steven G.; Rozner, Alexander G.; Wiley, Raymond C.; and Wishard, William N., to United States of America, Navy. Composite tungsten-steel armor penetrators. 4,961,383, Cl. 102-517.000.
Fitjer, Holger. Mascara applicator. 4,961,665, Cl. 401-129.000.
Flanagan, Joseph E.; and Woolery, Dean O., II, to Rockwell International Corporation. Energetic azido eutectics. 4,961,380, Cl. 102-287.000.
Flavell, James A.: *See*—
Duly, Raymond K.; and Flavell, James A., 4,961,772, Cl. 65-134.000.
Fleischer, Erwin: *See*—
Worschech, Kurt; Fleischer, Erwin; Wedl, Peter; Loeffelholz, Frido; and Brand, Ernst-Udo, 4,962,145, Cl. 524-310.000.
Fleming, Beverly M.; and Mapes, James P., to Becton Dickinson and Company. Storage and use of liposomes. 4,962,022, Cl. 435-7.000.
Fleming, Robert: *See*—
Lobbestael, Sandra J.; Nordin, Ivan C.; and Fleming, Robert, 4,962,116, Cl. 514-353.000.
Flemings, Merton C.: *See*—
Klier, Eric; Mortensen, Andreas; Cornie, James A.; and Flemings, Merton C., 4,961,461, Cl. 164-461.000.
Redemske, John A.; and Flemings, Merton C., 4,961,455, Cl. 164-63.000.
Flesher, Peter: *See*—
Allen, Adrian S.; Farrar, David; and Flesher, Peter, 4,962,172, Cl. 526-318.420.
Flight Dynamics, Inc.: *See*—
Wood, Robert B.; Thomas, Mark A.; and Desmond, John P., 4,961,625, Cl. 350-174.000.
Flynn, Daniel L.: *See*—
Boschelli, Diane H.; Connor, David T.; Flynn, Daniel L.; Sircar, Jagadish C.; and Hoefle, Milton L., 4,962,119, Cl. 514-384.000.
Focke & Co. (GmbH & Co.): *See*—
Focke, Heinz; and Balmer, Oskar, 4,961,437, Cl. 131-112.000.
Focke, Heinz; and Liedtke, Kurt, 4,961,496, Cl. 206-246.000.
Focke, Heinz; and Balmer, Oskar, to Focke & Co. (GmbH & Co.). Wrapping for bagpacks and a process and apparatus for producin it. 4,961,437, Cl. 131-112.000.

Focke, Heinz; and Liedtke, Kurt, to Focke & Co. (GmbH & Co.). Cigarette pack, especially hinge-lid box. 4,961,496, Cl. 206-246.000.

Foley, James W.; and Cincotta, Louis, to Rowland Institute for Science. Photo-inactivation of cancer cells. 4,962,197, Cl. 544-31.000.

Folk, Craig L.: *See—*
Sawhney, A. Paul S.; Folk, Craig L.; Robert, Kearny Q.; and Kimmel, Linda B., 4,961,306, Cl. 57-12.000.

Folk, Kenneth F.: *See—*
Buckley, Richard A.; and Folk, Kenneth F., 4,961,815, Cl. 156-468.000.

Fontana, Louis R.: *See—*
Swain, David M.; Needham, Gregory A.; and Fontana, Louis R., 4,961,627, Cl. 350-319.000.

Forbes, Charles. Extermination of insects by heat. 4,961,283, Cl. 43-124.000.

Ford Motor Company: *See—*
Carpenter, Ronald A., 4,961,603, Cl. 293-102.000.
Smowton, Mark, 4,961,554, Cl. 248-68.100.

Ford New Holland, Inc.: *See—*
McCarty, Horace G.; and Hurlburt, Joseph C., 4,961,303, Cl. 56-14.100.
Van Eecke, Roger H.; Naaktgeboren, Adrianus; and Van Den Bossche, Bart, 4,961,679, Cl. 414-111.000.

Forester, David R., to Betz Laboratories, Inc. Methods for retarding coke formation during pyrolytic hydrocarbon processing. 4,962,264, Cl. 585-648.000.

Forney, LeRoy S.: *See—*
Bodicky, Raymond O.; Crouther, Ronald; Forney, LeRoy S.; and Serowski, Andrew, 4,961,731, Cl. 604-264.000.

Fornoff, Karl-Heinz; and Kruska, Michael, to Nautico Gesellschaft fur Planung und Vertrieb von Rettungs- und- Badeinseln m.b.H. Rescue or bathing raft. 4,961,394, Cl. 114-266.000.

Foschaar, William L.: *See—*
Serkes, Jonathan M.; and Foschaar, William L., 4,962,033, Cl. 435-240.243.

Fosco International Limited: *See—*
Butler, David R.; Snow, George; Sandford, Philip; Neu, Max G.; Villani, Jean P.; Teyssedre, Alain; and Lenoir, Roland, 4,961,460, Cl. 164-134.000.

Foster, Stephen I.; and Stimler, Jeffrey J., to Dow Chemical Company, The. Non-dusting window envelope film utilizing a waxy anti-flecking agent. 4,961,800, Cl. 156-108.000.

Foster Wheeler Energy Corporation: *See—*
Johnson, Richard C., 4,961,761, Cl. 55-269.000.

Fournier, Joseph T., Jr.; Smith, Stephen J.; McKinley, Harry R.; and McLean, William E., to United Techologies Corporation. Direct incorporation of night vision in a helmet mounted display. 4,961,626, Cl. 350-174.000.

Fox, Robert D.: *See—*
Mak, Kai K.; Novak, Rudy G.; Fox, Robert D.; and Helsen, Richard W., 4,961,391, Cl. 110-346.000.

Fraenkel, Dan; Levy, Moshe; Ittah, Baruch; and Cherniavsky, Margaret, to Yeda Research & Development Company Limited. Catalysts and process for the production of hydrocarbons and substitution of hydrocarbons. 4,962,255, Cl. 585-467.000.

Framatome: *See—*
Chevereau, Gerard, 4,961,897, Cl. 376-234.000.

Frank, Dieter: *See—*
Moy, Paul Y. Y.; Parr, William J. E.; Frank, Dieter; and Hutton, Ronald E., 4,961,879, Cl. 252-512.000.

Frankel, Arthur E., to Cetus Corporation. Recombinant ricin toxin A chain conjugates. 4,962,188, Cl. 530-389.000.

Frankel, Milton B.; Wilson, Edgar R.; and Woolery, Dean O., II, to Rockwell International Corporation. Energetic azido curing agents. 4,962,213, Cl. 552-12.000.

Freeport-McMoRan, Inc.: *See—*
Perez, Jesus W.; Barrois, Melvin J.; McCord, Thomas H.; and O'Neil, Gregory R., 4,961,777, Cl. 75-313.000.

Frenette, Richard: *See—*
Young, Robert N.; Williams, Haydn W. R.; Leger, Serge; Frenette, Richard; and Zamboni, Robert, 4,962,203, Cl. 546-180.000.

Frey, Otto; and Koch, Rudolf, to Sulzer Brothers Limited. Sleeve for an acetabulum. 4,961,748, Cl. 623-22.000.

Fried, Herbert Elliott, to Shell Oil Company. Process for the selective separation of vinylidene olefins from mixtures with other olefins. 4,962,226, Cl. 560-205.000.

Frijlink, Peter M., to U.S. Philips Corporation. Epitaxial growth reactor provided with a planetary support. 4,961,399, Cl. 118-730.000.

Fritz Chemical Company: *See—*
Smith, Dwight; and Edwards, Jack L., 4,961,790, Cl. 106-315.000.

Frost Products Limited: *See—*
Biggar, R. Warren, 4,961,613, Cl. 312-38.000.

Frusho, Hiroyuki: *See—*
Ohtomo, Fumio; Frusho, Hiroyuki; and Ohtani, Hitoshi, 4,962,422, Cl. 358-88.000.

Fry, Slaton E.; Magouyrk, David W.; Blankenship, Allen J.; and Greene, Paul J., to Eastman Kodak Company. Modified chlorinated polyolefins. 4,962,149, Cl. 524-555.000.

Fuji Electric Co., Ltd.: *See—*
Tsuruoka, Michihiko; Nakagawa, Wataru; Machida, Masashi; and Kounosu, Naohiro, 4,961,345, Cl. 73-32.00A.

Fuji Jukogyo Kabushiki Kaisha: *See—*
Abe, Kunihiro; and Kobayashi, Tomoya, 4,962,456, Cl. 364-431.010.
Furuyama, Masaaki, 4,961,412, Cl. 123-520.000.

Fuji Photo Film Co., Ltd.: *See—*
Aida, Shunichi; and Shibata, Yoshinori, 4,962,015, Cl. 430-572.000.
Hakkaku, Kunio; and Kaida, Shinichi, 4,962,386, Cl. 346-1.100.
Hatori, Masami; and Nozaki, Nobuharu, 4,961,632, Cl. 350-358.000.
Hirota, Kiyoshi; and Kato, Hirokazu, 4,962,314, Cl. 250-318.000.
Ishikawa, Takatoshi; and Nakajima, Junya, 4,962,014, Cl. 430-393.000.
Kokubun, Kozo, 4,962,396, Cl. 352-174.000.
Kondo, Shigeru; Takatori, Naoki; Morizumi, Masaaki; and Kanamori, Shino, 4,961,635, Cl. 350-429.000.
Nakamura, Koki, 4,962,017, Cl. 430-551.000.
Nakamura, Takashi, 4,961,516, Cl. 222-94.000.
Ohtsuka, Shuichi; and Yamana, Keiichi, 4,962,432, Cl. 358-302.000.
Takahashi, Koichi, 4,962,401, Cl. 354-275.000.
Takeo, Hideya; and Shimura, Kazuo, 4,962,539, Cl. 382-9.000.
Washizu, Shintaro; Yamaguchi, Jun; Shinozaki, Fumiaki; Shimomura, Akihiro; Usami, Toshimasa; Endo, Toshiaki; and Saeki, Keiso, 4,962,009, Cl. 430-138.000.
Watanabe, Seiichi; Ishihara, Yusuke; and Irie, Tadashi, 4,961,884, Cl. 264-106.000.

Fuji Xerox Co., Ltd.: *See—*
Furuta, Haruo, 4,961,450, Cl. 141-364.000.

Fujii, Mamoru: *See—*
Kotani, Matahira; Matsumoto, Masafumi; Fujii, Mamoru; Hayashi, Motohiko; Hachinoda, Masayuki; Kondo, Mitsunobu; Murata, Naomitsu; and Mino, Kouichi, 4,962,526, Cl. 379-100.000.

Fujimoto, Hitoshi: *See—*
Komatsu, Fumiaki; Sakamoto, Junichi; Fujimoto, Hitoshi; Ohtsuka, Hiroshi; Saigusa, Kazuyuki; Kabasawa, Akifumi; Yokodate, Shinya; and Kashiwagi, Kenichi, 4,962,521, Cl. 379-53.000.

Fujimoto, Katsumi: *See—*
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Fujimura, Itaru: *See—*
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Fujino, Masahiko: *See—*
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Fujioka, Yosihide; Kanatani, Yoshiharu; Ohba, Toshihiro; and Uede, Hisashi, to Sharp Kabushiki Kaisha. Thin film el display panel drive circuit. 4,962,374, Cl. 340-781.000.

Fujishiro, Takeshi: *See—*
Ishikawa, Yasuki; Yasuno, Yoshiki; Higashimata, Akira; and Fujishiro, Takeshi, 4,962,455, Cl. 364-426.020.

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Fujitsu Limited: *See—*
Iwazaki, Tomonobu, 4,962,327, Cl. 307-449.000.
Kimura, Shinta; and Sanada, Toru, 4,962,535, Cl. 381-43.000.
Masuda, Yusuke; and Ogawa, Junji, 4,962,486, Cl. 365-230.030.
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Sunagawa, Makoto; Matsumura, Haruki; Inoue, Takaaki; Fukasawa, Masamoto; and Kato, Masuhiro, 4,962,103, Cl. 514-210.000.

Fukuda, Kazuaki, to Alps Electric Co., Ltd. Load condition detecting and driving system. 4,962,350, Cl. 323-283.000.

Fukui, Akio: *See—*
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Fukui, Yasuhiro; and Miyashita, Osamu. Oscillating vessel pump. 4,961,692, Cl. 417-241.000.

Fukumoto, Hiroshi: *See—*
Kan, Fumitaka; Tamura, Yasuyuki; Kushida, Naoki; Tohma, Koichi; Fukumoto, Hiroshi; Yuasa, Toshiya; Tohyama, Noboru; and Koizumi, Norihiko, 4,962,389, Cl. 346-140.00R.

Fukunaga, Yukio: *See—*
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dependent control for enhanced steering characteristics. 4,961,595, Cl. 280-772.000.
Fulton, Alfred L.; Smallwood, William L.; and Feemster, James A., to SCI Systems, Inc. Printing apparatus. 4,962,393, Cl. 346-150.000.
Furumoto, Horace: *See*—
Cho, George E.; and Furumoto, Horace, 4,961,414, Cl. 128-7.000.
Furuta, Haruo, to Fuji Xerox Co., Ltd. Toner cartridge. 4,961,450, Cl. 141-364.000.
Furuta, Yoshiki, to Pioneer Electronic Corporation. Data recording/reproducing apparatus and method for accurately playing program data after detecting program top signal. 4,962,435, Cl. 360-72.200.
Furuya, Akiko: *See*—
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Fuse, Shoji: *See*—
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Futatsuya, Fumio: *See*—
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Gabrilove, Janice L., to Sloan-Kettering Institute For Cancer Research. Methods for prevention and treatment of mucositis with granulocyte colony stimulating factor. 4,961,926, Cl. 424-85.100.
GAF Chemicals Corporation: *See*—
Chuang, Jui-Chang; Walls, Edward, Jr.; and Johnson, Stephen C., 4,961,921, Cl. 424-47.000.
Tazi, Mohammed; Kwak, Yoon T.; and Plochocka, Krystyna, 4,962,185, Cl. 528-497.000.
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Gajewski, Robert P., to Eli Lilly and Company. Alkanoyl anilides. 4,962,284, Cl. 564-194.000.
Galda, Michael P.; and Witt, Stephen H., to Stanpac Inc. Sealing member for a container. 4,961,986, Cl. 428-201.000.
Gallagher, William J.; Giess, Edward A.; Gupta, Aranava; Laibowitz, Robert B.; O'Sullivan, Eugene J.; and Sandstrom, Robert L., to International Business Machines Corporation. High T_c superconductor - gallate crystal structures. 4,962,086, Cl. 505-1.000.
Galvin, Patrick J. Paddle toss ball game. 4,961,587, Cl. 273-411.000.
Gambaro, Jeffrey J.: *See*—
Krinski, Thomas L.; Tran, Tam H.; and Gambaro, Jeffrey J., 4,961,788, Cl. 106-154.000.
Gangitano, Mario J.: *See*—
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Garde, Gerald: *See*—
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Gardetto, William W. Lever arm pump. 4,961,694, Cl. 417-464.000.
Garlock, Inc.: *See*—
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Garrigue, Roger; and Lalo, Jack, to Norsolor (Orkem Group). Process for curing aminoplastic resins. 4,962,182, Cl. 528-230.000.
Garvin, Henry M.; and Horsley, Christopher M. I.V. bag stabilizer. 4,961,557, Cl. 248-318.000.
Gasparian, George A., to ALcatel U.S.A. Corp. Method of making a bidirectional coupler for communication over single fiber. 4,961,801, Cl. 156-153.000.
Gaul, Norbert; Reinheimer, Guenter; and Weimar, Peter, to Ernst Leitz Wetzlar GmbH. Revolving nose piece for optical components and process for adjusting the number of revolutions thereof. 4,961,636, Cl. 350-520.000.
Gebert, Paul. Orbital spinner. 4,961,577, Cl. 275-109.000.
Geer, Robert G.: *See*—
Radwanski, Fred R.; Durocher, Donald F.; Chambers, Leon E., Jr.; Kasbo, Loyd G.; Cartwright, William F.; Geer, Robert G.; and Bullwinkel, Edward P., 4,961,415, Cl. 131-332.000.
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Geissberger, Arthur E.; Sadler, Robert A.; Menk, Gregory E.; and Balzan, Matthew L., to ITT Corporation. GaAs FET manufacturing process employing channel confining layers. 4,962,050, Cl. 437-22.000.
Gelman Sciences, Inc.: *See*—
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Genentech, Inc.: *See*—
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Cariou, Frank E.; and Harris, Theodore A., Jr., 4,961,994, Cl. 428-408.000.
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Wascher, Uwe; Mostwin, Jacek L.; Belden, Lorne, Jr.; and Kushner, Gerald, 4,961,747, Cl. 623-12.000.
General Hospital Corporation, The: *See*—
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General Motors Corporation: *See*—
Grey, Thaddeus J.; Braun, Charles W.; and Palmer, Dwight O., 4,961,413, Cl. 123-571.000.
Lindholm, Kari A.; and Bolsworth, James, 4,961,601, Cl. 292-216.000.
Micheli, Adolph L.; Dungan, Dennis F.; Hamdi, Aboud H.; Mantese, Joseph V.; and Laugal, Ruth Carol O., 4,962,088, Cl. 505-1.000.
Pees, James M., 4,961,594, Cl. 280-693.000.
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Gerber Garment Technology, Inc.: *See*—
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Gerrie, Richard W.; and Dahlgren, Victor F., to Sanders Associates, Inc. Method of making a printed circuit. 4,961,806, Cl. 156-252.000.
Geus, John W.: *See*—
Tijburg, Ivo I. M.; and Geus, John W., 4,962,280, Cl. 502-439.000.
Gibbons, Charles B.; and Abate, Victor R., to Lucas Aerospace Power Transmission Corp. Apparatus and method for transmitting condition data from a rotating member to a stationary device. 4,962,495, Cl. 370-1.000.
Giess, Edward A.: *See*—
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Gilbert, Robert C.: *See*—
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Gillette Canada Inc.: *See*—
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Gilmore, Joseph D. Incandescent heating unit. 4,962,295, Cl. 219-217.000.
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Globus, Alfred R. Method for preparing time-stable solutions of non-pyrogenic magnesium gluconocitrates. 4,962,208, Cl. 549-266.000.
Goda, Hidemitsu. Apparatus for feeding elongated material. 4,961,358, Cl. 82-127.000.
Godyak, Valery, to GTE Products Corporation. Glow discharge lamp having wire anode. 4,962,334, Cl. 313-619.000.
Goke, Louis R.: *See*—
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Goldberg, Eugene P.; Burns, James W.; Kumar, G. Sudesh; Osborn, David C.; Larson, Jeffrey A.; Sheets, John W.; Yahiaoui, Ali; and Robinson, Richard, to University of Florida. Surface modified surgical instruments, devices, implants, contact lenses and the like. 4,961,954, Cl. 427-2.000.
Goldberg, Steven R., to ITT Corporation. Solder paste applicator for circuit boards. 4,961,955, Cl. 427-57.000.
Gollinger, Franz X.; and Menzinger, Wendelin, to MAN Roland Druckmaschinen AG. Offset printing machine with readily accessible accessory apparatus. 4,961,379, Cl. 101-219.000.
Gonick, Harvey C.; Khalil-Manesh, Farhad; and Weiler, Elmar W. J., to Cedars-Sinai Medical Center. Method for silicon reduction with dimercaptosuccinic acid (DMSA). 4,962,127, Cl. 514-578.000.
Goodman, Sidney J.: *See*—
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Goodwin, Robert M.; and Manico, Joseph A., to Eastman Kodak Company. Adjusting photographic printer color exposure determination algorithms. 4,962,403, Cl. 355-38.000.
Gorman, Michael A.; Sterling, Mark H.; Kiehn, Robert M.; and Wood, Lowell T., to University of Houston - University Park. Optical coupler and refractive lamp. 4,961,622, Cl. 350-96.180.
Gossedge, Graham M.; Maskell, Alan J.; and Moore, John, to MB Group plc Engineering Company. Container with peelable seal, and method for making the same. 4,961,513, Cl. 220-276.000.
Gotanda, Masakazu: *See*—
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Gottselig, Bernd; Gyarmati, Erno; and Naoumidis, Aristides, to Kernforschungsanlage Julich GmbH. Method and components for bond-

ing a silicon carbide molded part to another such part or to a metallic part. 4,961,529, Cl. 228-124.000.
Gourdin, Jean-Paul, to Intermotra. Goods transport systems which are transformable into rail vehicles, and rail bogies for use therewith. 4,961,676, Cl. 410-53.000.
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Goyal, Shri K., to Amoco Corporation. Antifoam process for delayed coking. 4,961,840, Cl. 208-131.000.
Gozen, Yuksel, to Alcatel NA, Inc. Composite ringing and coin control voltage detector and method. 4,962,520, Cl. 379-29.000.
Graham, William M., to Nestle S.A. Intraocular lens. 4,961,745, Cl. 623-6.000.
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Green, Gary J.; and Shihabi, David S., to Mobil Oil Corp. Zeolitic copper catalyst. 4,962,075, Cl. 502-71.000.
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Grethlein, Hans E.; and Lynd, Lee H., to Dartmouth College, Trustees of. Distillation process for ethanol. 4,961,826, Cl. 203-19.000.
Grey, Thaddeus J.; Braun, Charles W.; and Palmer, Dwight O., to General Motors Corporation. Exhaust gas recirculation valve assembly. 4,961,413, Cl. 123-571.000.
Griffiths, Gerald R. Reusable sterile x-ray cassette holder. 4,961,502, Cl. 206-455.000.
Grimes, Gary J.: *See*—
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Grimwood, David A., to Insumat Limited. Fire-resisting material. 4,961,989, Cl. 428-229.000.
Groddeck, Michael; and Reifenscheid, Otto, to MTU Friedrichshafen. Duct for the distribution of lubricating oil. 4,961,479, Cl. 184-6.500.
Grollier, Jean F., to L'Oreal. Ultrafine inorganic powder containing melanin pigments, process for preparation thereof and its use in cosmetics. 4,961,754, Cl. 8-423.000.
Gross, Joseph: *See*—
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Grover, Gary J.; and Bergey, James L., to E. R. Squibb & Sons, Inc. Method of reducing pre-and post-ischemic myocardial arrhythmias and fibrillation. 4,962,095, Cl. 514-91.000.
Gruber, Kaplan & Associates: *See*—
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Godyak, Valery, 4,962,334, Cl. 313-619.000.
Johnson, Walter A.; Kopatz, Nelson E.; and Pruyne, Lori S., 4,961,770, Cl. 65-21.300.
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Guhne, Wieland; Ahlf, Heinz-Jurgen; and Eckart, Manfred, to Vorwerk & Co. Interholding GmbH. Electrical vacuum cleaner and filter bag for same. 4,961,765, Cl. 55-367.000.
Guirguis, Raouf A., to Cancer Diagnostics, Inc. Modular fluid sample preparation assembly. 4,961,432, Cl. 128-760.000.
Gunn, David. Chord key calculator assembly. 4,961,362, Cl. 84-474.000.
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Gurvich, Max A.; Parent, Robert W.; and Brandli, Eugene H., to Pace National Corporation. Process of repelling dogs and dog repellent material. 4,961,929, Cl. 424-196.100.
Gustafson, Bruce L.: *See*—
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Gutmann, Klaus. Conveying and storage device for thermosensitive products. 4,961,320, Cl. 62-3.200.
Guyan Machinery Co.: *See*—
Taylor, Jimmy; Singleton, David L.; Skeens, Stanley A.; and Runyon, Dennis R., 4,961,722, Cl. 494-36.000.
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Haag, Werner O.: *See*—
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Hachinoda, Masayuki: *See*—
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Hagiya, Koji; Suzukamo, Gohfu; Fukao, Masami; and Sakane, Hiroko, to Sumitomo Chemical Co., Ltd. Process for preparing racemic dihalovinylcyclopropane carboxylic acid halides. 4,962,233, Cl. 562-866.000.
Hahn, Robert W.: *See*—
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Haisma, Jan: *See*—
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Hall, David: *See*—
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Himes, Ronald E.; and Knox, John A., 4,961,466, Cl. 166-250.000.
Halm, Roland L.; Chadwick, Kirk M.; and Keyes, Brian R., to Dow Corning Corporation. Alkylation of halodisilanes. 4,962,219, Cl. 556-468.000.
Halm, Roland L.; and Zapp, Regie H., to Dow Corning Corporation. Method for preparing organohalosilanes. 4,962,220, Cl. 556-473.000.
Halvorson, Thomas G.; and Schaub, Herbert R., to Union Carbide Corporation. High pressure gas supply system. 4,961,325, Cl. 62-48.100.
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Takahashi, Hironori; Aoshima, Shinichiro; Nakamura, Iakuya; and Tsuchiya, Yutaka, 4,962,353, Cl. 324-96.000.
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Stine, Laurence O.; Reno, Mark E.; Munro, William H.; and Hamper, Simon J., 4,961,839, Cl. 208-102.000.
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Absil, Robert P. L.; Han, Scott; Marler, David O.; and Shihabi, David S., 4,962,257, Cl. 585-475.000.
Han, Yu-Pin: *See*—
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Hanagami, Teruyasu; Hino, Michihiro; Nakajima, Takeshi; and Hori, Shoichi, to Sony Corporation. Graphic printer. 4,962,467, Cl. 364-519.000.

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Hanna, Marie R.: *See*—
Sprecker, Mark A.; Belko, Robert P.; Brucato, Salvatore M.; Beck, Charles E. J.; and Hanna, Marie R., 4,962,090, Cl. 512-9.000.

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Tokura, Norihito; Kuno, Hironari; Ito, Hiroyasu; Saito, Hirohiko; and Hara, Kunihiko, 4,962,411, Cl. 357-23.400.

Hara, Toshihiro: *See*—
Murata, Yoshitoshi; Ohta, Yuji; Yotsutani, Akio; Hara, Toshihiro; Ono, Koji; and Fuse, Shoji, 4,962,524, Cl. 379-61.000.

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Doi, Hideaki; Hara, Yasuhiko; Sase, Akira; and Shinada, Satoshi, 4,962,541, Cl. 382-30.000.

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Harker, Howard R., to Axel Johnson Metals, Inc. Cold hearth refining. 4,961,776, Cl. 75-10.190.

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Reilly, Paul J., Jr.; and Harrett, Charles C., Jr., 4,961,454, Cl. 160-344.000.

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Higa, Kelvin T.; and Harris, Daniel C., 4,962,216, Cl. 556-129.000.

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Cariou, Frank E.; and Harris, Theodore A., Jr., 4,961,994, Cl. 428-408.000.

Harrison, Daniel J.; Weber, Helmut; and Yacobucci, Paul D., to Eastman Kodak Company. Color filter array element with polycarbonate receiving layer. 4,962,081, Cl. 503-227.000.

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Hartmann, Judy. Hair streaking apparatus. 4,961,439, Cl. 132-212.000.

Hartmann, Rudolf, to IBP Pietzsch GmbH. Anchoring element. 4,961,368, Cl. 89-36.020.

Hartwell Corporation, The: *See*—
Anderson, John P., 4,961,329, Cl. 70-2.000.

Harvilchuck, Joseph M.: *See*—
Beckham, Keith F.; Challener, David C.; Gupta, Arunava; Harvilchuck, Joseph M.; Leas, James M.; Lloyd, James R.; Long, David C.; Quinones, Horatio; Seshan, Krishna; and Shatzkes, Morris, 4,962,294, Cl. 219-121.680.

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Hasenwinkle, Earl D.: *See*—
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Hashimoto, Seiji: *See*—
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Hasselbusch, Michael D.: *See*—
Hsu, David K.; Margetan, Frank J.; Hasselbusch, Michael D.; Wormley, Samuel J.; Hughes, Michael S.; and Thompson, Donald O., 4,961,252, Cl. 29-25.350.

Hata, Tadashige: *See*—
Morishita, Hirohisa; Masamoto, Junzo; and Hata, Tadashige, 4,962,235, Cl. 568-493.000.

Hatanaka, Kaoru; Miyamaru, Yukio; and Kawada, Shigeo, to Honda Giken Kogyo Kabushiki Kaisha. Automatic turn signal cancelling apparatus. 4,962,366, Cl. 340-56.000.

Hatori, Masami; and Nozaki, Nobuharu, to Fuji Photo Film Co., Ltd. Light beam deflector/modulator. 4,961,632, Cl. 350-358.000.

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Kubota, Tatsuya; Gotanda, Masakazu; Hatta, Shinji; Karasawa, Hitoshi; Kubota, Tetsumaru; Nakamura, Takeaki; Takayama, Syuichi; and Sasaki, Hiroshi, 4,961,424, Cl. 128-24.00A.

Hauge, Carol: *See*—
Hauge, Ronald; and Hauge, Carol, 4,961,246, Cl. 15-401.000.

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Hawkins, William G.: *See*—
Drake, Donald J.; Hawkins, William G.; Campanelli, Michael R.; and Tellier, Thomas A., 4,961,821, Cl. 156-647.000.

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Matsumura, Masami; Hayashi, Masahiro; and Ueda, Atsushi, 4,961,410, Cl. 123-414.000.

Hayashi, Motohiko: *See*—
Kotani, Matahira; Matsumoto, Masafumi; Fujii, Mamoru; Hayashi, Motohiko; Hachinoda, Masayuki; Kondo, Mitsunobu; Murata, Naomitsu; and Mino, Kouichi, 4,962,526, Cl. 379-100.000.

Hayashi, Shunichi: *See*—
Kobayashi, Kazuyuki; and Hayashi, Shunichi, 4,961,409, Cl. 123-376.000.

Hayashi, Yoshimi: *See*—
Shimizu, Goro; Kamada, Masayasu; and Hayashi, Yoshimi, 4,961,972, Cl. 427-388.100.

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Hayenga, Kirk J.; Lawlis, Virgil B.; and Snedecor, Bradley R., to Genentech, Inc. Preparation of cheese with rennin from recombinant microbial cells. 4,961,938, Cl. 426-36.000.

Hayhurst, John O. Suture knotting instrument. 4,961,741, Cl. 606-139.000.

Haynes, Francis D.: *See*—
DenHartog, Stephen L.; Zarling, John P.; and Haynes, Francis D., 4,961,463, Cl. 165-45.000.

Head, James E.: *See*—
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Heaton, William A. L.: *See*—
Holme, Stein; and Heaton, William A. L., 4,961,928, Cl. 424-533.000.

Hecht, Matthew W.: *See*—
Mathildus, Gerardus L.; Hecht, Matthew W.; and Briones, Robert A., 4,962,492, Cl. 369-13.000.

Hedberg, William F.: *See*—
Crosno, Patricia J.; Mendelsohn, Gary H.; and Hedberg, William F., 4,962,463, Cl. 364-518.000.

Hedstrom Corp.: *See*—
Cunard, Joel C., 4,961,558, Cl. 248-370.000.

Hee, Dickson L. Method of producing an egg roll. 4,961,948, Cl. 426-556.000.

Heflin, Mark S.: *See*—
Credle, William S., Jr.; Ziesel, Lawrence B.; and Heflin, Mark S., 4,961,447, Cl. 141-1.000.

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Heidenreich, Holger; and Wehling, Klaus, to Miles Inc. Indicators for the detection of thiol groups. 4,962,019, Cl. 435-4.000.

Heisler, Mark: *See*—
Pemawansa, Kanyawasam P. W.; Heisler, Mark; and Kraus, Menahem, 4,961,852, Cl. 210-490.000.

Helbert, Thomas R.; Chianelli, Russell R.; Stiefel, Edward I.; and Jacobson, Allan J., to Exxon Research and Engineering Company. Transition metal tris-dithiolene and related complexes as precursors to active catalysts. 4,962,077, Cl. 502-220.000.

Helbig, Walter A., Sr., to General Electric Company. Systolic array processing apparatus. 4,962,381, Cl. 342-372.000.

Hellerman, John E. Manger divider. 4,961,401, Cl. 119-61.000.

Hellring, Stuart D., to Mobil Oil Corporation. Layered divalent metal phosphates containing pendent substituent groups and their preparation. 4,962,228, Cl. 562-8.000.

Helsen, Richard W.: *See*—
Mak, Kai K.; Novak, Rudy G.; Fox, Robert D.; and Helsen, Richard W., 4,961,391, Cl. 110-346.000.

Hemmann, Siglinde: *See*—
Blum, Helmut; and Hemmann, Siglinde, 4,962,229, Cl. 562-21.000.

Henkel Corporation: *See*—
Miyamoto, Satoshi; and Nagatani, Masamichi, 4,961,794, Cl. 148-262.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Blum, Helmut; and Hemmann, Siglinde, 4,962,229, Cl. 562-21.000.
Kresse, Franz; Osberghaus, Rainer; Scheller, Bernfrid; Schunter, Roland; and Tuchermann, Herta, 4,961,242, Cl. 15-228.000.
Spei, Brigitte; and Wehle, Volker, 4,961,858, Cl. 210-708.000.

Henn, Robert L.; Sakhpara, Dilip J.; Bailey, Christian E.; Bowser, John J.; and Brown, Peter L., to W. L. Gore & Associates, Inc. Fabrics for protective clothing. 4,961,985, Cl. 428-196.000.

Hennecke, Udo; and Schonfelder, Ralf, to Heraeus Quarzschmelze GmbH. Radiant unit. 4,962,310, Cl. 250-494.100.

Henning, Thomas P.; and Ellis, William O., to Deere & Company. Parts unloader for top delivery dies. 4,961,337, Cl. 72-426.000.
Henzi, Max P.; and Matoic, Marius, to Lavenir Technology, Inc. Serpentine columnar plotting system. 4,962,464, Cl. 364-518.000.
Her Majesty the Queen as represented by the Minister of National Defence of Her Majesty's Canadian Government: *See*—
Lee, Jim P., 4,962,382, Cl. 342-372.000.
Heraeus Quarzschmelze GmbH: *See*—
Hennecke, Udo; and Schonfelder, Ralf, 4,962,310, Cl. 250-494.100.
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Herberts, Kurt-Dieter, 4,961,628, Cl. 350-319.000.
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Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., to Mobil Oil Corporation. Catalytic cracking apparatus employing mixed catalyst system. 4,961,907, Cl. 422-144.000.
Hercules Incorporated: *See*—
Chu, Sung G.; Jablonier, Harold; and Nguyen, Tuyen T., 4,962,161, Cl. 525-422.000.
Hermann, Allen M.; and Sheng, Zhengzhi, to University of Arkansas. High temperature Tl-Ba-Ca-Cu-O and Tl-Sr-Ca-Cu-O superconductor. 4,962,083, Cl. 505-1.000.
Hernandez-Gil, Jose F.; Korotky, Steven K.; Murphy, Timothy O.; and Veselka, John J., to AT&T Bell Laboratories. Low loss waveguide intersection. 4,961,619, Cl. 350-96.120.
Hernandez, Irene H.; and McCaskill, Rex A., to International Business Machines Corporation. Method for generating a document utilizing a plurality of windows associated with different data objects. 4,962,475, Cl. 364-900.000.
Herrera, Juan H. Beeper amplifier. 4,962,528, Cl. 379-442.000.
Herrmann, Uwe: *See*—
Siedel, Joachim; Schellong, Lieselotte; Staepels, Johnny; Herrmann, Uwe; and Town, Michael-Harold, 4,961,970, Cl. 436-84.000.
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Hershenson, Susan; Shaked, Ze'ev; and Thomson, Jody, to Cetus Corporation. Process for recovering microbially produced interferon-β. 4,961,969, Cl. 435-69.510.
Herzog, Klaus, to Carl-Zeiss-Stiftung. Method and apparatus for making coordinate measurements. 4,961,267, Cl. 33-503.000.
Hewitt, Ronnie D. Adaptable irrigation valve operation system. 4,961,538, Cl. 239-728.000.
Hewlett-Packard Company: *See*—
Dunsmore, Joel P., 4,962,359, Cl. 324-638.000.
Skene, John M.; Thierheimer, Charles L., Jr.; and Hindagolla, Suraj L., 4,961,785, Cl. 106-22.000.
Heyde, John B., to Dentsply Management Corp. Irrigants for use in scaling and/or lavage apparatus. 4,961,923, Cl. 424-49.000.
Hibbard, Robert H.; Parulski, Kenneth A.; and D'Luna, Lionel J., to Eastman Kodak Company. Detail processing method and apparatus providing uniform processing of horizontal and vertical detail components. 4,962,419, Cl. 358-37.000.
Hibi, Takuo: *See*—
Fukao, Masami; Hibi, Takuo; Ikimi, Kiyoshi; and Suzukamo, Gohfu, 4,962,254, Cl. 585-452.000.
Hickey, Robert C. Toy containing dental cleaning apparatus. 4,961,717, Cl. 446-76.000.
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Higa, Kelvin T.; and Harris, Daniel C., to United States of America, Navy. Preparation of dineopentylcadmium. 4,962,216, Cl. 556-129.000.
Higashi, Kunio: *See*—
Sato, Makoto; Takemura, Makoto; Higashi, Kunio; Soga, Tsunehiko; Matsumoto, Hiroo; and Nishi, Toshiyuki, 4,962,202, Cl. 546-112.000.
Higashimata, Akira: *See*—
Ishikawa, Yasuki; Yasuno, Yoshiki; Higashimata, Akira; and Fujishiro, Takeshi, 4,962,455, Cl. 364-426.020.
Higashimura, Koichi: *See*—
Kitahara, Tsuyoshi; Yosekubo, Shuji; Morozumi, Hideki; Higashimura, Koichi; and Matsuzawa, Masanao, 4,962,391, Cl. 346-140.00R.
Higgins, Larry G. Dispensing system for handling consumable tooling and supplies. 4,961,507, Cl. 221-129.000.
Highland Manufacturing and Sales Company: *See*—
Weder, Donald E.; and Weder, Erin H., 4,961,375, Cl. 100-45.000.
Higuchi, Chojiro: *See*—
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Hill, Francis U.; and Crosswhite, Lola E., to Sorrento Engineering Corporation. Method of improving foam fire resistance through the introduction of inorganic particles thereinto. 4,962,132, Cl. 521-55.000.
Hill-Rom Company, Inc.: *See*—
Koerber, Clement J., Sr., 4,961,470, Cl. 177-144.000.
Hiller, Joseph F.: *See*—
Morabito, Paul L.; Melcher, Richard G.; Hiller, Joseph F.; and McCabe, Terrence, 4,962,042, Cl. 436-161.000.
Hillis, James E.; and Green, William G., to Dow Chemical Company, The. Composition for removing iron contamination from magnesium. 4,961,783, Cl. 75-307.000.
Hillstrom, Rune: *See*—
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Himes, Ronald E.; and Knox, John A., to Halliburton Company. Method for effecting controlled break in polysaccharide gels. 4,961,466, Cl. 166-250.000.
Hindagolla, Suraj L.: *See*—
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Hines, John B.: *See*—
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Hanagami, Teruyasu; Hino, Michihiro; Nakajima, Takeshi; and Hori, Shoichi, 4,962,467, Cl. 364-519.000.
Hippely, Keith A.; Joshi, Madhusudan; and Wood, Larry R., to Mattel, Inc. Toy apparatus including robotic arm. 4,961,716, Cl. 446-75.000.
Hirane, Hideo; Tanno, Kiyohiko; Yagi, Kentaro; and Iitsuka, Hisao, to Hitachi, Ltd.; Seiko Instruments Inc.; and Hitachi Cable, Ltd. Driving circuit for a light emitting diode array. 4,962,375, Cl. 340-782.000.
Hirano, Shinichi; Toyokuni, Ryo; and Kuroda, Hiroshi, to Hirano, Shinichi; and Seiko Instruments & Electronics Ltd. Method of manufacturing calcium carbonate single crystal. 4,961,823, Cl. 156-623.00R.
Hirata, Toshio: *See*—
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Hiratsuna, Satoshi; and Hotta, Hiroshi, to 501 Dai-Ichi Kogyo Seiyaku Co., Ltd. Method for preparing a flame-retardant triallyl isocyanurate prepolymer. 4,962,168, Cl. 526-193.000.
Hiroki, Masashi; Koseki, Junichi; and Todome, Tuyoshi, to Kabushiki Kaisha Toshiba. Image reading body and image formation body detachably mounted to a control body. 4,962,430, Cl. 358-296.000.
Hirosawa, Noriyuki: *See*—
Homma, Koji; Kihira, Hiroshi; Ito, Satoshi; Matsuoka, Kazumi; and Hirosawa, Noriyuki, 4,962,360, Cl. 324-700.000.
Hirota, Kiyoshi; and Kato, Hirokazu, to Fuji Photo Film Co., Ltd. Image transfer apparatus. 4,962,314, Cl. 250-318.000.
Hirschmann, Clemens; Ungerer, Heinz-Jurgen; and Mellem, Joachim, to Grunzweig & Hartman AG. Facility for generating fibers, in particular mineral fibers, from a molten mass. 4,961,695, Cl. 425-72.200.
Hitachi Cable, Ltd.: *See*—
Hirane, Hideo; Tanno, Kiyohiko; Yagi, Kentaro; and Iitsuka, Hisao, 4,962,375, Cl. 340-782.000.
Hitachi Koki Company, Ltd.: *See*—
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Asayama, Kyoichiro; Miyazawa, Hiroyuki; Kobayashi, Yutaka; and Yukutake, Seigou, 4,962,052, Cl. 437-31.000.
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Kawasaki, Satoru; and Kondo, Masahiro, 4,962,315, Cl. 250-336.100.
Naoi, Nobuaki; Takeda, Katunobu; and Yuki, Ikuo, 4,962,426, Cl. 358-167.000.
Ogino, Masanori, 4,961,642, Cl. 353-38.000.
Takeshima, Masahiko; and Mitsuishi, Naoki, 4,962,484, Cl. 365-226.000.
Hitachi Maxell, Ltd.: *See*—
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Hitachi video engineering, Incorporated: *See*—
Doi, Hideaki; Hara, Yasuhiko; Sase, Akira; and Shinada, Satoshi, 4,962,541, Cl. 382-30.000.
Hitchiner Manufacturing Co., Inc.: *See*—
Redemske, John A.; and Flemings, Merton C., 4,961,455, Cl. 164-63.000.
Ho, W. S. Winston; Sartori, Guido; and Stogryn, Eugene L., to Exxon Research and Engineering Company. Absorbent composition containing a severely-hindered amine mixture with amine salts and/or aminoacid additives for the absorption of H_2S. 4,961,873, Cl. 252-189.000.
Hockney, Richard L.: *See*—
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Hodgson, Rodney T.; LeGoues, Francoise K.; and Wells, Oliver C., to International Business Machines Corporation. Magnetically filtered low loss scanning electron microscopy. 4,962,306, Cl. 250-310.000.
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Winter, Andreas; Antberg, Martin; and Rohrmann, Jurgen, 4,962,248, Cl. 585-12.000.
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Hoechst Celanese Corp.: *See*—
Chen, Paul N., Sr.; and Vora, Rohitkumar H., 4,962,183, Cl. 528-342.000.
DeMartino, Ronald N.; Yoon, Hyun-Nam; Stamatoff, James B.; and Buckley, Alan, 4,962,160, Cl. 525-404.000.
Osuch, Christopher E.; and McFarland, Michael J., 4,962,171, Cl. 526-266.000.
Vicari, Richard, 4,962,147, Cl. 524-460.000.
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Hoffmann-La Roche Inc.: *See*—
Knesel, Ernest A., Jr.; Shoemaker, Daniel R.; and Fansler, David V., 4,962,044, Cl. 436-177.000.

Hofmann, JoHann H.: *See*—
House, Randall; Covarrubias, Jesse; Hofmann, JoHann H.; and Powell, Jerry, 4,961,293, Cl. 52-21.000.

Hogan, James S. Adjustable ventilation, air purification and storage apparatus for modular office furniture. 4,961,766, Cl. 55-385.200.

Holbrook, Michael T.; and Juhlke, Timothy, to Dow Chemical Company, The. Process for the production of halogenated hydrocarbons. 4,962,247, Cl. 570-240.000.

Holderfield, Daron C.; Martin, Bernard E.; and Russell, Samuel S., to United States of America, Army. Thermal test chamber device. 4,962,355, Cl. 324-158.00F.

Holdsworth, Robert S.: *See*—
O'Neill, Gerald J.; and Holdsworth, Robert S., 4,961,321, Cl. 62-114.000.

Holme, Stein; and Heaton, William A. L., to American Red Cross. Synthetic, plasma-free, transfusible storage medium for red blood cells and platelets. 4,961,928, Cl. 424-533.000.

Holmes, William, Jr.: *See*—
Thompson, Barbara J.; Bingham, Russell D.; and Holmes, William, Jr., 4,961,579, Cl. 273-153.00R.

Homick, Richard: *See*—
Lim, Draholsav; Jacoby, Stephen; Homick, Richard; and Powers, Frank, 4,961,746, Cl. 623-6.000.

Homma, Koji; Kihira, Hiroshi; Ito, Satoshi; Matsuoka, Kazumi; and Hirosawa, Noriyuki, to Nippon Steel Corporation. Sensor for electrochemical measurement and method for diagnosing corrosion protective properties of metal surface coating by using the sensor. 4,962,360, Cl. 324-700.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hatanaka, Kaoru; Miyamaru, Yukio; and Kawada, Shigeo, 4,962,366, Cl. 340-56.000.
Ida, Yasuhiko, 4,962,361, Cl. 336-90.000.
Irino, Hiroshi; and Iida, Mitsumasa, 4,961,355, Cl. 74-513.000.
Ishikawa, Yoshikazu; and Yamaguchi, Kouji, 4,961,315, Cl. 60-327.000.
Itoh, Kazuhito; Fujimoto, Katsumi; and Kuroda, Kouji, 4,961,669, Cl. 403-359.000.
Kawaguchi, Toru; and Endo, Masaaki, 4,961,403, Cl. 123-2.000.
Kurihara, Norimitsu; Asakura, Masahiko; Anzai, Hidehiko; and Matsui, Mitsuru, 4,961,475, Cl. 180-179.000.
Simoyama, Yoshirou; Nakajima, Toyohei; Tanaka, Nobuyuki; and Miyake, Tetsuya, 4,961,690, Cl. 417-222.000.

Honda, Toshio: *See*—
Tsujiuchi, Junpei; Ikeda, Shigeto; Honda, Toshio; Ohyama, Nagaaki; Badique, Eric; and Kikuchi, Susumu, 4,962,540, Cl. 382-17.000.

Honeywell Control Systems Limited: *See*—
Wilson, Alistair R., 4,962,395, Cl. 340-619.000.

Hoover, Thomas M.; and Talaski, Edward J., to Walbro Corporation. Fuel pump isolation mount. 4,961,693, Cl. 417-363.000.

Hoover Universal, Inc.: *See*—
Barth, John M., 4,961,701, Cl. 425-527.000.

Hoppe, Thomas, to Ciba-Geigy Corporation. Trap for flying insects, especially moths that attack foodstuffs. 4,961,282, Cl. 43-114.000.

Horak, Jire,acu/i : *See*—
Cermak, Pavel; Monhart, Vaclay; Horak, Jire,acu/i ; Tlustakova, Marie; and Paroubek, Miroslav, 4,962,036, Cl. 435-34.000.

Hori, Shoichi: *See*—
Hanagami, Teruyasu; Hino, Michihiro; Nakajima, Takeshi; and Hori, Shoichi, 4,962,467, Cl. 364-519.000.

Horikoshi, Koki; Kudo, Toshiaki; and Kato, Chiaki, to Rikagaku Kenkyusho. Plasmid, method for construction of the same, microorganisms carrying the plasmid and method for cultivation of the microorganism. 4,962,055, Cl. 435-252.800.

Hormadaly, Jacob, to Du Pont de Nemours, E. I., and Company. Thermistor composition. 4,961,999, Cl. 428-427.000.

Horodysky, Andrew G.: *See*—
Doner, John P.; Horodysky, Andrew G.; and Keller, John A., Jr., 4,961,868, Cl. 252-32.70E.

Horsley, Christopher M.: *See*—
Garvin, Henry M.; and Horsley, Christopher M., 4,961,557, Cl. 248-318.000.

Hosaka, Kunio: *See*—
Matsuoka, Yoshiyuki; Hosaka, Kunio; Takeda, Shigefumi; and Mitsuhashi, Hiroshi, 4,962,211, Cl. 549-436.000.

Hosiden Electronics Co., Ltd.: *See*—
Komatsu, Yasuhiro, 4,961,710, Cl. 439-267.000.

Hosoi, Yoshio: *See*—
Kitagawa, Kiyoshi; Hosoi, Yoshio; Sogawa, Akira; Onodera, Chikau; and Onuma, Tadashi, 4,961,435, Cl. 128-788.000.

Hotta, Hiroshi: *See*—
Hiratsuna, Satoshi; and Hotta, Hiroshi, 4,962,168, Cl. 526-193.000.

Houghten, Richard A.: *See*—
Cuervo, Julio H.; and Houghten, Richard A., 4,962,277, Cl. 514-14.000.

House, Randall; Covarrubias, Jesse; Hofmann, JoHann H.; and Powell, Jerry, to House, Randall. Precast, prestressed concrete secondary containment vault. 4,961,293, Cl. 52-21.000.

Hovis, Keith W., to Phillips Petroleum Company. Alkylation catalyst isolation. 4,962,268, Cl. 585-705.000.

Howard, Barbara D. Dishcloth hanger cabinet. 4,961,612, Cl. 312-37.000.

Howard, Ronald A., to Ucar Carbon Technology Corporation. Flexible graphite laminate. 4,961,991, Cl. 428-246.000.

Howe, Michael G.; Arthur, James C.; and Usleman, Robert T., to Arvin Industries, Inc. Tuned exhaust processor assembly. 4,961,314, Cl. 60-288.000.

Howeth, D. Franklin. Structurally reinforced, self-aligning panel filter apparatus with associated clamping, face sealing and backflushing structure. 4,961,762, Cl. 55-302.000.

Hoya Corporation: *See*—
Mochizuki, Takayasu; Unternahrer, Josef R.; and Moriyama, Mitsuhisa, 4,962,505, Cl. 372-72.000.
Takahara, Hiroaki; and Asanuma, Shigeru, 4,961,773, Cl. 65-174.000.

Hrubiec, Robert T.: *See*—
Sartorelli, Alan C.; Shyam, Krishnamurthy; and Hrubiec, Robert T., 4,962,114, Cl. 514-311.000.

Hsu, David K.; Margetan, Frank J.; Hasselbusch, Michael D.; Wormley, Samuel J.; Hughes, Michael S.; and Thompson, Donald O., to Iowa State University Research Foundation, Inc. Means and method for nonuniform poling of piezoelectric transducers. 4,961,252, Cl. 29-25.350.

Hu, Patrick H.: *See*—
White, Frederic H., III; Hu, Patrick H.; and Bettis, Jerry R., 4,962,309, Cl. 250-396.00R.

Hudson, Donald. Live bait protector and hook apparatus. 4,961,280, Cl. 43-44.990.

Hudson, J. Richard: *See*—
Anderson, Charles D.; Cummings, Carl S.; and Hudson, J. Richard, 4,962,279, Cl. 501-150.000.

Hudson, John L. Log splitting apparatus. 4,961,452, Cl. 144-193.00A.

Huff, Martin; and Kuchelmeister, Ulrich L., to Zahnradfabrik Friedrichshafen AG. Oil circulation in wheel head transmission. 4,961,485, Cl. 192-4.00A.

Hughes Aircraft Company: *See*—
Dell-Imagine, Robert A.; Parrish, Millard J.; and Carnaghie, John A., 4,962,488, Cl. 367-3.000.
Dolan, Cyril F., 4,961,313, Cl. 60-223.000.
LeCompte, George W., 4,961,545, Cl. 242-54.00R.
Owechko, Yuri; and Soffer, Bernard H., 4,961,615, Cl. 350-3.680.
Renshaw, Kenneth H., 4,962,507, Cl. 375-1.000.
Rosen, Harold A., 4,961,551, Cl. 244-164.000.
Schreiber, Christopher M., 4,961,259, Cl. 29-852.000.

Hughes, Michael S.: *See*—
Hsu, David K.; Margetan, Frank J.; Hasselbusch, Michael D.; Wormley, Samuel J.; Hughes, Michael S.; and Thompson, Donald O., 4,961,252, Cl. 29-25.350.

Hughes, Steven K.: *See*—
Barnes, James F., Jr.; Herron, Roy H., Jr.; and Hughes, Steven K., 4,961,245, Cl. 15-339.000.

Hugl, Herbert; Engel, Aloysius; and Wehling, Klaus, to Bayer Aktiengesellschaft. 2-hydrazono-4,6-dinitrobenzthiazolones useful to form dyestuffs and as color formers for detecting peroxide. 4,962,040, Cl. 436-135.000.

Hujsak, Edward J., to General Dynamics Corporation, Convair Division. Method and device for protecting a liquid rocket booster from impact and environmental damage to permit recovery and reuse. 4,961,550, Cl. 244-138.00R.

Hull Corporation: *See*—
Fay, John M., 4,961,273, Cl. 34-92.000.

Hull, Harold L.; and Klingamen, Allen. Magnetically attached filter. 4,961,849, Cl. 210-169.000.

Hulsey, David A., to Micron Technology, Inc. Underhood having combined skirt and release means. 4,961,232, Cl. 2-206.000.

Hummel, Wolfgang, to Siemens Aktiengesellschaft. Can for receiving a cluster of fuel rods containing nuclear fuel. 4,961,900, Cl. 376-272.000.

Hungerbuhler, Ernst; and Kalvoda, Jaroslav, to Ciba-Geigy Corporation. (3S, 4R)-3,4-trans-disubstituted azetidin-2-one intermediates. 4,962,196, Cl. 540-357.000.

Hunter-Melnor, Inc.: *See*—
Chow, Ho; and Goodman, Sidney J., 4,961,662, Cl. 401-42.000.

Hunter, Thomas: *See*—
Jensen, Michael L.; Ray, Craig D.; Hunter, Thomas; and Dawes, Keith, 4,962,286, Cl. 174-92.000.

Huntress, Arnold R.; Landis, Daryl D.; McVannel, Donald E.; and Allen, Timothy, to Dow Corning Corporation. Chloride reduction in polysiloxanes. 4,962,221, Cl. 556-456.000.

Hunts, Rick E. Car carrier strapping aid. 4,961,524, Cl. 224-324.000.

Hurlburt, Joseph C.: *See*—
McCarty, Horace G.; and Hurlburt, Joseph C., 4,961,303, Cl. 56-14.100.

Hutcheson, Neale C.: *See*—
Mallozzi, Joseph D.; Hutcheson, Neale C.; Breault, Michelle S.; and Daniels, Edward P., 4,962,459, Cl. 364-464.020.

Hutt, Marland P., Jr.; and Kiely, John S., to Warner-Lambert Company. Antibacterial quinoline compounds. 4,962,108, Cl. 514-249.000.

Hutton, Ronald E.: *See—*
Moy, Paul Y. Y.; Parr, William J. E.; Frank, Dieter; and Hutton, Ronald E., 4,961,879, Cl. 252-512.000.

Hyatt, James R.: *See—*
Suarez, Francis S.; Roberts, James E.; Kamdar, Vinayak P.; Hyatt, James R.; and Lowe, Lloyd A., 4,961,563, Cl. 266-229.000.

Iacoviello, John G.; Davidowich, George; Vijayendran, Bheema R.; and Sadowski, John S., to Air Products and Chemicals, Inc. Ethylene-vinyl chloride copolymer emulsions containing tetramethylol glycoluril for use as binder compositions. 4,962,141, Cl. 524-92.000.

IBP Pietzsch GmbH: *See—*
Hartmann, Rudolf, 4,961,368, Cl. 89-36.020.

Ibrahim, Abd-el-Fattah A.; and Campbell, Hugh P., to Xerox Corporation. VLSI optimized modulator. 4,961,633, Cl. 350-392.000.

Ibuchi, Yoshiaki, to Sharp Kabushiki Kaisha. Pressure device for use in image forming apparatuses. 4,962,402, Cl. 355-27.000.

Ichiguchi, Hirokazu. Method of producing grinding tool and apparatus for producing same. 4,961,807, Cl. 156-261.000.

Ichikawa, Shunji: *See—*
Nakamura, Joji; Kubo, Kazuhiro; Ichikawa, Shunji; Takahashi, Hajime; Isozumi, Keisuke; and Yamada, Toyofumi, 4,962,107, Cl. 514-237.500.

Ida, Yasuhiko, to Honda Giken Kogyo Kabushiki Kaisha. Ignition coil for engine. 4,962,361, Cl. 336-90.000.

IDL, Inc.: *See—*
Boone, Daniel E., 4,961,343, Cl. 73-152.000.

Iff, Ron H.: *See—*
Perdelwitz, Jr., Lee E.; Young, Robert H.; Hasenwinkle, Earl D.; Iff, Ron H.; and Neogi, Amar H., 4,961,930, Cl. 424-411.000.

Igarashi, Hitoshi, to Seiko Epson Corporation. Printer case. 4,961,659, Cl. 400-693.000.

Igari, Kenji, to Alpine Electronics Inc. Radio receiver. 4,962,544, Cl. 455-186.000.

Iguchi, Shin: *See—*
Okada, Yoshio; Kawasaki, Koichi; and Iguchi, Shin, 4,962,225, Cl. 560-163.000.

Ihara Chemical Kogyo Kabushiki Kaisha: *See—*
Nakamura, Joji; Kubo, Kazuhiro; Ichikawa, Shunji; Takahashi, Hajime; Isozumi, Keisuke; and Yamada, Toyofumi, 4,962,107, Cl. 514-237.500.

Iida, Atsuko; Ohdaira, Hirosi; Katsura, Masaki; Nishikawa, Reiji; and Ozawa, Norio, to Kabushiki Kaisha Toshiba. Optical recording medium. 4,961,979, Cl. 428-64.000.

Iida, Katsumi; and Takano, Akihiko, to Diesel Kiki Co., Ltd. Control apparatus for automobile air-conditioners. 4,961,462, Cl. 165-12.000.

Iida, Mitsumasa: *See—*
Iriso, Hiroshi; and Iida, Mitsumasa, 4,961,355, Cl. 74-513.000.

Iijima, Satoshi: *See—*
Takasa, Kenji; and Iijima, Satoshi, 4,962,001, Cl. 428-524.000.

Iimure, Tamio, to Nippon Paint Co., Ltd. Photo-curable coating compositions. 4,961,960, Cl. 427-54.100.

Iitsuka, Hisao: *See—*
Hirane, Hideo; Tanno, Kiyohiko; Yagi, Kentaro; and Iitsuka, Hisao, 4,962,375, Cl. 340-782.000.

Ikeda Bussan Co., Ltd.: *See—*
Okada, Masahiro; and Matsumoto, Hiroki, 4,961,353, Cl. 74-457.000.

Ikeda, Shigeto: *See—*
Tsujiuchi, Junpei; Ikeda, Shigeto; Honda, Toshio; Ohyama, Nagaaki; Badique, Eric; and Kikuchi, Susumu, 4,962,540, Cl. 382-17.000.

Ikenaga, Takao; Shigematsu, Toshifumi; Kusumoto, Akio; Yamamoto, Kimiyoshi; and Yada, Masatoshi, to Toto, Ltd. Toilet device with health examination system. 4,961,431, Cl. 128-760.000.

Ikimi, Kiyoshi: *See—*
Fukao, Masami; Hibi, Takuo; Ikimi, Kiyoshi; and Suzukamo, Gohfu, 4,962,254, Cl. 585-452.000.

Ikoma, Kazuhiko: *See—*
Okuno, Akiyasu; Watanabe, Masakazu; and Ikoma, Kazuhiko, 4,961,987, Cl. 428-209.000.

Ikuno, Hajime: *See—*
Yamada, Senichi; Towata, Shinichi; Ikuno, Hajime; Yamamura, Takemi; Ishikawa, Toshihiro; and Shibuya, Masaki, 4,961,990, Cl. 428-240.000.

Imada, Sadao: *See—*
Okada, Yoshio; Imada, Sadao; and Shimizu, Mitsuru, 4,962,320, Cl. 361-56.000.

Imai, Hitoshi; and Okada, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Optical data storage system with wavelength selective laminate. 4,962,479, Cl. 365-119.000.

Imai, Tamotsu: *See—*
Abrevaya, Hayim; and Imai, Tamotsu, 4,962,261, Cl. 585-500.000.

Imakawa, Susumu; Takeyama, Yoshinobu; Kubo, Nobuaki; and Saitoh, Masanori, to Ricoh Company, Ltd. Synchronizing signal generating system for laser scanner. 4,962,431, Cl. 358-296.000.

Imperial Chemical Industries PLC: *See—*
Austin, Peter W., 4,962,123, Cl. 514-514.000.
Dalton, Raymond F.; and Burgess, Arthur, 4,961,856, Cl. 210-681.000.
McDonald, Edward; Salmon, Roger; and Whittle, Alan J., 4,962,109, Cl. 514-256.000.
Turner, Ralph W., 4,962,209, Cl. 549-419.000.

In Vitro Scientific Products: *See—*
Serkes, Jonathan M.; and Foschaar, William L., 4,962,033, Cl. 435-240.243.

INA Walzlager Schaeffler KG: *See—*
Rabe, Jurgen, 4,961,651, Cl. 384-51.000.

Inco Alloys International, Inc.: *See—*
Benn, Raymond C., 4,961,818, Cl. 156-603.000.
deBarbadillo, John J., II; and Smith, Gaylord D., 4,962,084, Cl. 419-19.000.
deBarbadillo, John J., II; and Smith, Gaylord D., 4,962,085, Cl. 505-1.000.
Suarez, Francis S.; Roberts, James E.; Kamdar, Vinayak P.; Hyatt, James R.; and Lowe, Lloyd A., 4,961,563, Cl. 266-229.000.

Industrie Pirelli S.p.A.: *See—*
Cappa, Giulio; Moscatelli, Romano; and La Torre, Paolo, 4,961,420, Cl. 128-207.120.

Inoue, Hiroaki: *See—*
Yamazaki, Seiichi; Inoue, Hiroaki; Takashima, Sumihiro; and Shishikura, Hiroshisa, 4,962,413, Cl. 357-42.000.

Inoue, Hiromichi: *See—*
Ohno, Kouji; Inoue, Hiromichi; Saito, Shinichi; Miyazawa, Kazutoshi; and Ushioda, Makoto, 4,961,875, Cl. 252-299.660.

Inoue, Hiroshi; and Kanno, Hideo, to Canon Kabushiki Kaisha. Display control apparatus having a plurality of driving voltage supplying means. 4,962,376, Cl. 340-784.000.

Inoue, Shigeru: *See—*
Tanabe, Haruyoshi; Kawakami, Masahiro; Takahashi, Kenji; Iwasaki, Katsuhiro; and Inoue, Shigeru, 4,961,784, Cl. 75-623.000.

Inoue, Shinichi: *See—*
Yamada, Nobuo; Takezawa, Toshiyuki; Sayo, Noboru; Yagi, Misao; Kumobayashi, Hidenori; Akutagawa, Susumu; Takaya, Hidemasa; Inoue, Shinichi; and Noyori, Ryoji, 4,962,242, Cl. 568-822.000.

Inoue, Takaaki: *See—*
Sunagawa, Makoto; Matsumura, Haruki; Inoue, Takaaki; Fukasawa, Masamoto; and Kato, Masuhiro, 4,962,103, Cl. 514-210.000.

Inoue, Tetsuya: *See—*
Matsumoto, Hisashi; Takami, Masaaki, deceased; Takahashi, Nobuyuki; and Inoue, Tetsuya, 4,962,079, Cl. 503-226.000.

Insumat Limited: *See—*
Grimwood, David A., 4,961,989, Cl. 428-229.000.

Intel Corporation: *See—*
Baerg, William; and Rao, Valluri R. M., 4,961,812, Cl. 156-345.000.

Intenational Business Machines Corporation: *See—*
Hodgson, Rodney T.; LeGoues, Francoise K.; and Wells, Oliver C., 4,962,306, Cl. 250-310.000.

Intermotra: *See—*
Gourdin, Jean-Paul, 4,961,676, Cl. 410-53.000.

International Business Machines Corporation: *See—*
Beauregard, Gary M.; Loucks, Larry K.; Nguyen, Khoa D.; and Urquhart, Robert J., 4,962,468, Cl. 364-521.000.
Beckham, Keith F.; Challener, David C.; Gupta, Arunava; Harvilchuck, Joseph M.; Less, James M.; Lloyd, James R.; Long, David C.; Quinones, Horatio; Seshan, Krishna; and Shatzkes, Morris, 4,962,294, Cl. 219-121.680.
Case, Douglas R.; and Conner, Watson M., 4,962,451, Cl. 364-900.000.
Cronin, John E.; and Lee, Pei-ing P., 4,962,058, Cl. 437-187.000.
Gallagher, William J.; Giess, Edward A.; Gupta, Aranava; Laibowitz, Robert B.; O'Sullivan, Eugene J.; and Sandstrom, Robert L., 4,962,086, Cl. 505-1.000.
Hernandez, Irene H.; and McCaskill, Rex A., 4,962,475, Cl. 364-900.000.
Jones, Alan L.; and Synder, Keith A., 4,962,416, Cl. 357-81.000.
Kasiraj, Chander; and Wolf, Timothy J., 4,962,532, Cl. 380-25.000.
Kreiser, Paul D., 4,962,474, Cl. 364-900.000.
Solomon, Paul M., 4,962,409, Cl. 357-22.000.

International Flavors & Fragrances Inc.: *See—*
Boden, Richard M.; and McGhie, Joseph A., 4,962,089, Cl. 512-6.000.
Sprecker, Mark A.; Belko, Robert P.; Brucato, Salvatore M.; Beck, Charles E. J.; and Hanna, Marie R., 4,962,090, Cl. 512-9.000.

International Paper Box Machine Co., Inc.: *See—*
Labombarde, Raymond A., deceased, 4,961,566, Cl. 271-35.000.

International Technology Corporation: *See—*
Mak, Kai K.; Novak, Rudy G.; Fox, Robert D.; and Helsen, Richard W., 4,961,391, Cl. 110-346.000.

Intevep, S.A.: *See—*
Velasco, Leon; Mota, Carlos; and Rodriguez, Domingo, 4,961,837, Cl. 208-41.000.

IntraCel Corporation: *See—*
Place, John F., 4,962,047, Cl. 436-518.000.

Investment Holding Corporation: *See—*
Aurichio, Joseph A., 4,961,804, Cl. 156-248.000.

Investment Rarities Incorporated: *See—*
Burandt, Corliss O., 4,961,406, Cl. 123-90.150.

Iowa State University Research Foundation, Inc.: *See—*
Hsu, David K.; Margetan, Frank J.; Hasselbusch, Michael D.; Wormley, Samuel J.; Hughes, Michael S.; and Thompson, Donald O., 4,961,252, Cl. 29-25.350.

Irie, Tadashi: *See—*
Watanabe, Seiichi; Ishihara, Yusuke; and Irie, Tadashi, 4,961,884, Cl. 264-106.000.

Irie, Yasuo: *See*—
Yokozeki, Kenzo; Shirae, Hideyuki; Shiragami, Hiroshi; Irie, Yasuo; Yasuda, Naohiko; Otani, Masaru; and Tanabe, Toshiya, 4,962,193, Cl. 536-24.000.
Irino, Hiroshi; and Iida, Mitsumasa, to Honda Giken Kogyo Kabushiki Kaisha. Throttle control system. 4,961,355, Cl. 74-513.000.
Irlen, Helen L. Method and apparatus of treatment of symptoms of the Irlen syndrom. 4,961,640, Cl. 351-44.000.
IRSST-Institut de Recherche en Sante et en Securite du Travail du Quebec: *See*—
Lesage, Jacques; and Perrault, Guy, 4,961,916, Cl. 422-88.000.
Isakson, Larry E., to Allied-Signal Inc. Collapsible filter for a fluid power apparatus. 4,961,846, Cl. 210-131.000.
Ishihara, Takafumi: *See*—
Kihara, Noriaki; Tomino, Ikuo; Tan, Hiroaki; and Ishihara, Takafumi, 4,962,200, Cl. 544-333.000.
Ishihara, Yusuke: *See*—
Watsnabe, Seiichi; Ishihara, Yusuke; and Irie, Tadashi, 4,961,884, Cl. 264-106.000.
Ishikawa, Hiromi: *See*—
Kato, Yoshiaki; Yuyama, Harumi; Ojima, Tutomu; and Ishikawa, Hiromi, 4,962,485, Cl. 365-229.000.
Ishikawa, Norio; and Ishimura, Toshihiko, to Minolta Camera Kabushiki Kaisha. Data input/output device for a camera. 4,962,397, Cl. 354-21.000.
Ishikawa, Shigeru: *See*—
Fujiura, Yoshitsugu; Ishikawa, Shigeru; and Kodama, Hiromitsu, 4,961,711, Cl. 430-357.000.
Ishikawa, Takatoshi; and Nakajima, Junya, to Fuji Photo Film Co., Ltd. Process for processing silver halide color photographic materials. 4,962,014, Cl. 430-393.000.
Ishikawa, Toshihiro: *See*—
Yamada, Senichi; Towata, Shinichi; Ikuno, Hajime; Yamamura, Takemi; Ishikawa, Toshihiro; and Shibuya, Masaki, 4,961,990, Cl. 428-240.000.
Ishikawa, Yasuki; Yasuno, Yoshiki; Higashimata, Akira; and Fujishiro, Takeshi, to Nissan Motor Company Limited. Anti-skid brake control system with feature of projection of vehicle body speed representative data with high precision. 4,962,455, Cl. 364-426.020.
Ishikawa, Yoshikazu; and Yamaguchi, Kouji, to Honda Giken Kogyo Kabushiki Kaisha. Method of controlling speed reduction ratio of continuously variable speed transmission. 4,961,315, Cl. 60-327.000.
Ishikawajima-Harima Heavy Industries Co., Ltd.: *See*—
Arakawa, Takahiro; Yoshikawa, Kazuo; and Atsuta, Yoshimichi, 4,961,347, Cl. 73-644.000.
Ishimura, Toshihiko: *See*—
Ishikawa, Norio; and Ishimura, Toshihiko, 4,962,397, Cl. 354-21.000.
Ishiyama, Kazufumi: *See*—
Rokurohta, Haruyasu; and Ishiyama, Kazufumi, 4,962,332, Cl. 73-632.000.
Ishiyama, Kiyoshige: *See*—
Okuno, Takeshi; and Ishiyama, Kiyoshige, 4,962,392, Cl. 346-145.000.
Isovolta Osterreichische Isolierstoffwerke Aktiengeselischaft: *See*—
Fialla, Peter, 4,962,180, Cl. 528-176.000.
Isozumi, Keisuke: *See*—
Nakamura, Joji; Kubo, Kazuhiro; Ichikawa, Shunji; Takahashi, Hajime; Isozumi, Keisuke; and Yamada, Toyofumi, 4,962,107, Cl. 514-237.500.
Isozumi, Shuzoo, to Mitsubishi Denki Kabushiki Kaisha. Engine starter with variable length front bracket. 4,962,340, Cl. 290-48.000.
Itakura, Masato; Takakura, Yoshinari; and Tanahashi, Toshio, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Internal combustion engine with water-cooling intercooler. 4,961,404, Cl. 123-41.310.
Itani, Talal A.: *See*—
McDavid, William T.; Bryce, William W.; and Itani, Talal A., 4,962,510, Cl. 375-67.000.
Ito, Atsushi: *See*—
Enari, Hiroyuki; Kumazawa, Satoru; Shimizu, Susumu; Ito, Atsushi; Sato, Nobuo; and Saishojo, Toshihide, 4,962,278, Cl. 514-399.000.
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Tokura, Norihito; Kuno, Hironari; Ito, Hiroyasu; Saito, Hirohiko; and Hara, Kunihiko, 4,962,411, Cl. 357-23.400.
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Kawai, Shuji; Oshino, Kazushi; Okoshi, Hiromi; Mori, Hajime; Ozaki, Katsuya; Shikata, Shitsuw; Ito, Susumu; and Okamoto, Kikuhiko, 4,962,030, Cl. 435-209.000.
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Itoh, Kuniharu, to NEC Corporation. Code violation detection circuit for use in AMI signal transmission. 4,962,509, Cl. 375-17.000.
ITT Corporation: *See*—
Crain, Lawrence, 4,962,473, Cl. 364-900.000.
Geissberger, Arthur E.; Sadler, Robert A.; Monk, Gregory E.; and Balzan, Matthew L., 4,962,050, Cl. 437-22.000.
Goldberg, Steven R., 4,961,955, Cl. 427-57.000.
Johnson, Charles B.; and Blank, Richard E., 4,961,278, Cl. 42-101.000.
Ittah, Baruch: *See*—
Fraenkel, Dan; Levy, Moshe; Ittah, Baruch; and Cherniavsky, Margaret, 4,962,255, Cl. 585-467.000.
Iwai, Hiroji, to Sharp Kabushiki Kaisha. Method for correcting mistypes in an electric typewriter. 4,961,660, Cl. 400-697.100.
Iwaki, Akio: *See*—
Uehara, Masafumi; Nogami, Akira; Shimura, Kazuhiro; Yumiki, Keiichi; and Iwaki, Akio, 4,961,859, Cl. 210-725.000.
Iwamoto, Hisao: *See*—
Iwamoto, Yoichi; and Iwamoto, Hisao, 4,961,663, Cl. 401-78.000.
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Iwasaki, Katsuhiro: *See*—
Tanabe, Haruyoshi; Kawakami, Masahiro; Takahashi, Kenji; Iwasaki, Katsuhiro; and Inoue, Shigeru, 4,961,784, Cl. 75-623.000.
Iwasaki, Tetsuji; and Mori, Yoshihisa, to Kao Corporation. Milk replacer for infant cattle and method for breeding infant cattle using the same. 4,961,934, Cl. 426-002.000.
Iwazaki, Tomonobu, to Fujitsu Limited. Decoder circuit having selective transfer circuit for decoded output signal. 4,962,327, Cl. 307-449.000.
J. I. Case Company: *See*—
Ovsborn, Jesse H.; and Hahn, Robert W., 4,961,304, Cl. 56-10.200.
Jabarin, Saleh A.; and Balduff, Dennis C., to Owens-Illinois Plastic Products Inc. Degradable polymers and articles made therefrom. 4,962,164, Cl. 525-445.000.
Jabloner, Harold: *See*—
Chu, Sung G.; Jabloner, Harold; and Nguyen, Tuyen T., 4,962,161, Cl. 525-422.000.
Jacino, Anthony: *See*—
Jacino, Gerald; and Jacino, Anthony, 4,961,883, Cl. 264-36.000.
Jacino, Gerald; and Jacino, Anthony. Glass break repair apparatus valve and method. 4,961,883, Cl. 264-36.000.
Jack, Michael D., to Santa Barbara Research Center. Frequency domain integrating resonant superconducting transmission line detector. 4,962,316, Cl. 250-336.200.
Jacobson, Allan J.: *See*—
Helbert, Thomas R.; Chianelli, Russell R.; Stiefel, Edward I.; and Jacobson, Allan J., 4,962,077, Cl. 502-220.000.
Jacoby, Stephen: *See*—
Lim, Drahoslav; Jacoby, Stephen; Homick, Richard; and Powers, Frank, 4,961,746, Cl. 623-6.000.
Jaguar Cars Limited: *See*—
Parsons, Bryan N. V., 4,961,408, Cl. 123-193.00P.
Jakobsen, Palle; and Drejer, Jorgen, to A/S Ferrosan. Aryloxyphenylpropylamines and their preparation and use. 4,962,122, Cl. 514-466.000.
Jalbert, Vincent P.: *See*—
Daggett, Kenneth E.; Onaga, Eimei M.; Casler, Richard J., Jr.; Booth Barrett L.; and Jalbert, Vincent P., 4,962,338, Cl. 318-568.110.
Jamas, Spiros; Easson, D. Davidson, Jr.; and Bistrian, Bruce R., to Alpha Beta Technology, Inc. Glucan dietary additives. 4,962,094, Cl. 514-54.000.
James River Corporation: *See*—
Perrin, Patrick C.; and Whittington, Jimmie L., 4,961,796, Cl. 156-69.000.
Janecek, Kenneth F., to Baker Hughes. Amendment addition system and method for twin belt press filter. 4,961,862, Cl. 210-778.000.
Janocko, David J., to Westinghouse Electric Corp. Reactor coolant pump having double dam seal with self-contained injection pump mechanism. 4,961,678, Cl. 415-170.100.
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Van Daele, Georges, 4,962,115, Cl. 514-326.000.
Jason, Andrew J.; and Blind, Barbara, to United States of America, Energy. Confined energy distribution for charged particle beams. 4,962,317, Cl. 250-396.0ML.
Jefferies, Steven R., to Dentsply Research & Development Corp. Method for obtaining a band technique dental impression. 4,961,706, Cl. 433-214.000.
Jenkins, Wayne; and Marx, Richard. Plant irrigation system. 4,961,285, Cl. 47-79.000.
Jensen, Michael L.; Ray, Craig D.; Hunter, Thomas; and Dawes, Keith, to Raychem Corporation. Environmental control, liner for splice enclosure. 4,962,286, Cl. 174-92.000.
Jett, James H.; Keller, Richard A.; Martin, John C.; Moyzis, Robert K.; Ratliff, Robert L.; Shera, E. Brooks; and Stewart, Carleton C., to United States of America, America. Method for rapid base sequencing in DNA and RNA. 4,962,037, Cl. 435-6.000.
Jinbo, Toshikatsu, to NEC Corporation. Nonvolatile memory device using a sense circuit including variable threshold transistors. 4,962,482, Cl. 365-189.110.
Jingu, Toshiharo; and Kusayanagi, Masao, to NCR Corporation. Record media drive mechanism for dot matrix printer. 4,961,657, Cl. 400-599.000.
Johansson, Lennart: *See*—
Corke, Andrew; and Johansson, Lennart, 4,961,316, Cl. 60-431.000.

John Labatt Limited/John Labatt Limitee: *See*—
Singer, Norman S.; Latella, Joseph; and Shoji, Yamamoto, 4,961,953, Cl. 426-656.000.

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Johnson, Bruce G.: *See*—
Downer, James R.; Eisenhaure, David B.; Hockney, Richard L.; and Johnson, Bruce G., 4,961,352, Cl. 74-5.460.

Johnson, Charles B.; and Blank, Richard E., to ITT Corporation. Day/night telescopic sight. 4,961,278, Cl. 42-101.000.

Johnson Food Equipment, Inc.: *See*—
Criscione, Frank J., II; Bonuchi, James A.; and Crawford, David R., 4,961,248, Cl. 17-11.200.

Johnson, Keith A.: *See*—
Butler, John D.; and Johnson, Keith A., 4,961,357, Cl. 81-9.510.

Johnson, Richard C., to Foster Wheeler Energy Corporation. Cyclone separator wall refractory material system. 4,961,761, Cl. 55-269.000.

Johnson, Robert W., Jr., to Union Camp Corporation. Method of improving the color of tall oil rosin esters by recrystallizing and distilling rosin followed by esterifying. 4,962,186, Cl. 530-218.000.

Johnson, Stephen C.: *See*—
Chuang, Jui-Chang; Walls, Edward, Jr.; and Johnson, Stephen C., 4,961,921, Cl. 424-47.000.

Johnson, Steven P.: *See*—
Zinnen, Hermann A.; and Johnson, Steven P., 4,962,273, Cl. 585-831.000.

Johnson, Walter A.; Kopatz, Nelson E.; and Pruyne, Lori S., to GTE Products Corporation. Process for producing spherical glass particles. 4,961,770, Cl. 65-21.300.

Joist, Michael: *See*—
Schwenk, Hans M.; Gunther, Hans-Ulrich; and Joist, Michael, 4,961,712, Cl. 439-436.000.

Jones, Alan L.; and Synder, Keith A., to International Business Machines Corporation. Electronic package with a device positioned above a substrate by suction force between the device and heat sink. 4,962,416, Cl. 357-81.000.

Jones, George C. Kit for converting a hand-powered wheeg34air to an electric motor-power wheelchair. 4,961,473, Cl. 180-65.100.

Jones, Robert S.; and Maurer, John J., to Eastman Kodak Company. Compact contact printer with a flexible transparent cover sheet. 4,962,405, Cl. 355-84.000.

Jones, Roger L., to Ahlstrom Filtration, Inc. Laminated filters. 4,961,974, Cl. 428-34.200.

Jordan, Arthur K.; and Lakshmanasamy, S., to United States of America, Navy. Optical communication system having a wide-core single-mode planar waveguide. 4,961,618, Cl. 350-96.120.

Jorgensen, Janine L.: *See*—
Caskey, Terrence L.; Jorgensen, Janine L.; and Trimmer, Johnny L., 4,961,760, Cl. 35-158.000.

Joseph, Peter M.; Michalek, Thomas G.; and Gruber, Mylan, to Dr. Joseph's Foot Products, Inc. Foot cleaning and chemical application apparatus. 4,961,733, Cl. 604-293.000.

Joshi, Madhusudan: *See*—
Hippely, Keith A.; Joshi, Madhusudan; and Wood, Larry R., 4,961,716, Cl. 446-75.000.

Josso, Pierre: *See*—
Alperine, Serge; and Josso, Pierre, 4,962,005, Cl. 428-670.000.

Judenich, Gennady I., to Teatr Polifonicheskoi Dramy. Entertainment video information system having a multiplane screen. 4,962,420, Cl. 358-60.000.

Juhlke, Timothy: *See*—
Holbrook, Michael T.; and Juhlke, Timothy, 4,962,247, Cl. 570-240.000.

Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich, 4,961,614, Cl. 312-341.100.
Rock, Erich, 4,961,648, Cl. 384-19.000.

Jung, Herbert: *See*—
Wullenweber, Heinz; Kohl, Peter; Jung, Herbert; Borchardt, Jorgen; Bickle, Wolfgang; Braus, Jurgen; and Hiedemann, Hans-Joachim, 4,961,901, Cl. 419-2.000.

Juy, Henri, to Simplex S. A. Front derailleur for bicycles or similar vehicles. 4,961,720, Cl. 474-80.000.

Kabasawa, Akifumi: *See*—
Komatsu, Fumiaki; Sakamoto, Junichi; Fujimoto, Hitoshi; Ohtsuka, Hiroshi; Saigusa, Kazuyuki; Kabasawa, Akifumi; Yokodate, Shinya; and Kashiwagi, Kenichi, 4,962,521, Cl. 379-53.000.

Kabushiki Kaisha: *See*—
Nogami, Hiroyasu; Miike, Seiji; Takeda, Kimihito; Amano, Shinya; and Aoyama, Chiaki, 4,962,452, Cl. 364-419.000.

Kabushiki Kaisha Fuso: *See*—
Hashimoto, Teiji, 4,961,541, Cl. 241-65.000.

Kabushiki, Kaisha Kawa, Gakki Seisakusho: *See*—
Yamagishi, Fujio; and Miura, Hirohiko, 4,961,361, Cl. 84-201.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Morishita, Masao; Kawatani, Hiroshi; and Minamide, Toshiyuki, 4,961,781, Cl. 75-244.000.

Kabushiki Kaisha Kobe Sieko Sho: *See*—
Kato, Yoshio; and Kawashima, Ichiro, 4,961,484, Cl. 192-3.310.

Kabushiki Kaisha Sakato Kosakusho: *See*—
Sakato, Seiichi; Sakato, Masahiko; Matsui, Kunihiko; and Watanabe, Nobuo, 4,961,543, Cl. 241-266.000.

Kabushiki Kaisha TOPCON: *See*—
Ohtomo, Fumio; Frusho, Hiroyuki; and Ohtani, Hitoshi, 4,962,422, Cl. 358-88.000.

Kabushiki Kaisha Toshiba: *See*—
Aoki, Masayuki, 4,962,292, Cl. 219-10.55B.
Hiroki, Masashi; Koseki, Junichi; and Todome, Tuyoshi, 4,962,430, Cl. 358-296.000.
Iida, Atsuko; Ohdaira, Hirosi; Katsura, Masaki; Nishikawa, Reiji; and Ozawa, Norio, 4,961,979, Cl. 428-64.000.
Kamaga, Ryuichi, 4,962,418, Cl. 358-29.000.
Kuge, Toru; and Kinoshita, Hiroshi, 4,962,543, Cl. 455-89.000.
Murata, Yoshitoshi; Ohta, Yuji; Yotsutani, Akio; Hara, Toshihiro; Ono, Koji; and Fuse, Shoji, 4,962,524, Cl. 379-61.000.
Okada, Yoshio; Imada, Sadao; and Shimizu, Mitsuru, 4,962,320, Cl. 361-56.000.
Rokurohta, Haruyasu; and Ishiyama, Kazufumi, 4,962,332, Cl. 73-632.000.
Sakai, Tadashi; Uno, Shigeki; Koyama, Masao; and Nakamura, Nanao, 4,961,833, Cl. 204-403.000.
Suzuki, Azuma, 4,962,487, Cl. 365-233.500.
Takeda, Yasushi, 4,961,984, Cl. 428-192.000.
Tokumaru, Takeji, 4,962,511, Cl. 377-69.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Yamada, Senichi; Towata, Shinichi; Ikuno, Hajime; Yamamura, Takemi; Ishikawa, Toshihiro; and Shibuya, Masaki, 4,961,990, Cl. 428-240.000.

Kabushiki Kaishi Toshiba: *See*—
Yamaki, Bunshiro; and Matsuoka, Nobutaka, 4,962,056, Cl. 437-62.000.

Kadokura, Hidekimi; Harakawa, Masashi; and Nogami, Nagatoshi, to Sumitomo Chemical Company, Limited. Process for producing inorganic fiber. 4,961,889, Cl. 264-63.000.

Kaida, Shinichi: *See*—
Hakkaku, Kunio; and Kaida, Shinichi, 4,962,386, Cl. 346-1.100.

Kaihatsu, Noboru, to Nisshinbo Industries, Inc. Aromatic package. 4,961,493, Cl. 206-0.500.

Kajiji, Shama; and Quaranta, Vito, to Scripps Clinic & Research Foundation. Monoclonal antibodies to human pancreatic cancer. 4,962,048, Cl. 436-548.000.

Kakizaki, Shinobu: *See*—
Yamaoka, Fumiyuki; Kakizaki, Shinobu; and Kikushima, Shigeru, 4,961,483, Cl. 188-299.000.

Kalinski, Robert J.; Cerwin, Robert J.; and Alpern, Marvin, to Ethicon, Inc. Oval wrap suture package. 4,961,498, Cl. 206-339.000.

Kalvoda, Jaroslav: *See*—
Hungerbuhler, Ernst; and Kalvoda, Jaroslav, 4,962,196, Cl. 540-357.000.

Kamada, Masayasu: *See*—
Shimizu, Goro; Kamada, Masayasu; and Hayashi, Yoshimi, 4,961,972, Cl. 427-388.100.

Kamada, Yutaka: *See*—
Hashimoto, Yutaka; Yumoto, Masanobu; Umaba, Toshihiko; Kamada, Yutaka; Matsubara, Tsutomu; and Kawaguchi, Sigeo, 4,961,976, Cl. 428-34.600.

Kamaga, Ryuichi, to Kabushiki Kaisha Toshiba. Color picture display apparatus. 4,962,418, Cl. 358-29.000.

Kamdar, Vinayak P.: *See*—
Suarez, Francis S.; Roberts, James E.; Kamdar, Vinayak P.; Hyatt, James R.; and Lowe, Lloyd A., 4,961,563, Cl. 266-229.000.

Kamibayasi, Isao, to Mitsubishi Denki Kabushiki Kaisha. Solenoid valve. 4,961,561, Cl. 251-120.000.

Kamis, Russell P.: *See*—
Chu, Hsien-Kun; Kamis, Russell P.; Klosowski, Jerome M.; and Lower, Loren D., 4,962,076, Cl. 502-158.000.

Kamishiro, Toshiro: *See*—
Masaki, Mitsuo; Takeda, Hiromitsu; Kamishiro, Toshiro; and Yamamoto, Masao, 4,962,096, Cl. 514-92.000.

Kamyr AB: *See*—
Ekholm, Rolf; Hillstrom, Rune; and Palsson, Daniel, 4,961,844, Cl. 209-273.000.

Kan, Fumitaka; Tamura, Yasuyuki; Kushida, Naoki; Tohma, Koichi; Fukumoto, Hiroshi; Yuasa, Toshiya; Tohyama, Noboru; and Koizumi, Norihiko, to Canon Kabushiki Kaisha. Image recorder using ink imparted with adhesiveness by electro-chemical reaction. 4,962,389, Cl. 346-140.00R.

Kanai, Takashi; Kimura, Michio; and Noguchi, Yoshio, to Toray Industries. Process for preparing halogenated benzene derivatives. 4,962,245, Cl. 570-211.000.

Kanamori, Shino: *See*—
Kondo, Shigeru; Takatori, Naoki; Morizumi, Masaaki; and Kanamori, Shino, 4,961,635, Cl. 350-429.000.

Kanatani, Yoshiharu: *See*—
Fujioka, Yosihide; Kanatani, Yoshiharu; Ohba, Toshihiro; and Uede, Hisashi, 4,962,374, Cl. 340-781.000.

Kanbara, Hiroshi: *See*—
Katayama, Seizi; and Kanbara, Hiroshi, 4,962,217, Cl. 556-429.000.

Kanebo, Ltd.: *See*—
Iwamoto, Yoichi; and Iwamoto, Hisao, 4,961,663, Cl. 401-78.000.

Kaneko, Takashi: *See*—
Satake, Yoshikatsu; Yamamoto, Shinji; Kaneko, Takashi; Tada, Masahito; Kashiwadate, Ken; Mizuno, Toshiya; Endo, Hiroyuki; Katto, Takayuki; and Shiiki, Zenya, 4,962,143, Cl. 524-100.000.

Kaneoya, Masakazu: *See*—
Yoshida, Naoyuki; Kaneoya, Masakazu; Uchida, Manabu; and Morita, Hiroshi, 4,962,031, Cl. 435-280.000.

Kanno, Hideo: *See*—
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Kanzaki Paper MFG. Co., Ltd.: *See*—
Watanabe, Kazuo, 4,962,080, Cl. 503-227.000.

Kao Corporation: *See*—
Iwasaki, Tetsuji; and Mori, Yoshihisa, 4,961,934, Cl. 426-002.000.

Kawai, Shuji; Oshino, Kazushi; Okoshi, Hiromi; Mori, Hajime; Ozaki, Katsuya; Shikata, Shitsuw; Ito, Susumu; and Okamoto, Kikuhiko, 4,962,030, Cl. 435-209.000.

Kapak Corporation: *See*—
Bell, Gary M., 4,961,503, Cl. 206-627.000.

Kapmeyer, Wolfgang, to Behringwerke Aktiengesellschaft. Dispersion polymers, and their use. 4,962,046, Cl. 436-533.000.

Karasawa, Hitoshi: *See*—
Kubota, Tatsuya; Gotanda, Masakazu; Hatta, Shinji; Karasawa, Hitoshi; Kubota, Tetsumaru; Nakamura, Takeaki; Takayama, Syuichi; and Sasaki, Hiroshi, 4,961,424, Cl. 128-24.00A.

Karasawa, Kazunori: *See*—
Sohmiya, Norimasa; Koichi, Yasushi; and Karasawa, Kazunori, 4,962,394, Cl. 346-160.100.

Karolyi, Oskar, to Michael Horauf Maschinenfabrik GmbH & Co. KG. Methods and apparatus for folding textile materials. 4,961,565, Cl. 270-45.000.

Kasbo, Loyd G.: *See*—
Radwanski, Fred R.; Durocher, Donald F.; Chambers, Leon E., Jr.; Kasbo, Loyd G.; Cartwright, William F.; Geer, Robert G.; and Bullwinkel, Edward P., 4,961,415, Cl. 131-332.000.

Kase, Hiroshi; Matauda, Yuzuru; Shirahata, Kunikatsu; Yasuzawa, Toru; and Yamada, Koji, to Kyowa Hakko Kogyo, Co., Ltd. Novel substance KS-619-1, preparation process and pharmaceutical. 4,962,125, Cl. 514-569.000.

Kashiwadate, Ken: *See*—
Satake, Yoshikatsu; Yamamoto, Shinji; Kaneko, Takashi; Tada, Masahito; Kashiwadate, Ken; Mizuno, Toshiya; Endo, Hiroyuki; Katto, Takayuki; and Shiiki, Zenya, 4,962,143, Cl. 524-100.000.

Kashiwagi, Kenichi: *See*—
Komatsu, Fumiaki; Sakamoto, Junichi; Fujimoto, Hitoshi; Ohtsuka, Hiroshi; Saigusa, Kazuyuki; Kabasawa, Akifumi; Yokodate, Shinya; and Kashiwagi, Kenichi, 4,962,521, Cl. 379-53.000.

Kasiraj, Chander; and Wolf, Timothy J., to International Business Machines Corporation. Method for providing notification of classified electronic message delivery restriction. 4,962,532, Cl. 380-25.000.

Kassman, Leon B. Condom applicator and packaging. 4,961,734, Cl. 604-349.000.

Katagiri, Sigenobu: *See*—
Nemoto, Shigeo; Namikawa, Osamu; Tsuchiya, Kiyomi; Nakajima, Isao; Kikuchi, Yasuo; Sugaya, Tomio; Ogawa, Toshitaka; and Katagiri, Sigenobu, 4,961,704, Cl. 432-8.000.

Katakura, Yasuko: *See*—
Shinjo, Masayoshi; Okamoto, Sumiko; Katakura, Yasuko; and Takubo, Seiji, 4,962,156, Cl. 525-100.000.

Katayama, Seizi; and Kanbara, Hiroshi, to Shin-Etsu Chemical Co., Ltd. Organosilicon compounds having a mercapto group in the molecule. 4,962,217, Cl. 556-429.000.

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Horikoshi, Koki; Kudo, Toshiaki; and Kato, Chiaki, 4,962,055, Cl. 435-252.800.

Kato, Hiroaki, to Sharp Kabushiki Kaisha. Liquid crystal display device. 4,961,629, Cl. 350-332.000.

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Hirota, Kiyoshi; and Kato, Hirokazu, 4,962,314, Cl. 250-318.000.

Kato, Masuhiro: *See*—
Sunagawa, Makoto; Matsumura, Haruki; Inoue, Takaaki; Fukasawa, Masamoto; and Kato, Masuhiro, 4,962,103, Cl. 514-210.000.

Kato, Yoshiaki; Yuyama, Harumi; Ojima, Tutomu; and Ishikawa, Hiromi, to Citizen Watch Co., Ltd. Noncontacting IC card supplied with power from an outside source. 4,962,485, Cl. 365-229.000.

Kato, Yoshio; and Kawashima, Ichiro, to Kabushiki Kaisha Kobe Seiko Sho. Brake device for vehicle. 4,961,484, Cl. 192-3.310.

Katoh, Toshio: *See*—
Mita, Ryuichi; Katoh, Toshio; Higuchi, Chojiro; Oura, Takeshi; and Yamaguchi, Akihiro, 4,962,222, Cl. 560-41.000.

Katou, Kouki: *See*—
Kojima, Tatsuo; Kobayashi, Tatsunori; Katou, Kouki; Ohba, Tetsuya; Yatsuzuka, Takashi; and Tanabe, Koji, 4,961,261, Cl. 29-895.210.

Katsumi, Iida, to Diesel Kiki Co., Ltd. Control apparatus for automobile air-conditioners. 4,962,302, Cl. 236-13.000.

Katsuna, Kiyoharu; Ogura, Kenji; and Hirata, Toshio, to Nippondenso Co., Ltd. Automotive air conditioner. 4,961,323, Cl. 62-244.000.

Katsuno, Hisashi: *See*—
Yamamoto, Takashi; Yoneda, Toshikazu; Katsuno, Hisashi; Murakawa, Takashi; and Takahashi, Nobuyuki, 4,962,251, Cl. 585-419.000.

Katsura, Masaki: *See*—
Iida, Atsuko; Obdaira, Hirosi; Katsura, Masaki; Nishikawa, Reiji; and Ozawa, Norio, 4,961,979, Cl. 428-64.000.

Katto, Takayuki: *See*—
Satake, Yoshikatsu; Yamamoto, Shinji; Kaneko, Takashi; Tada, Masahito; Kashiwadate, Ken; Mizuno, Toshiya; Endo, Hiroyuki; Katto, Takayuki; and Shiiki, Zenya, 4,962,143, Cl. 524-100.000.

Kawabata, Itaru: *See*—
Masuda, Jitsuo; Morimoto, Junji; Yamagishi, Ken; Kinashi, Hiroshi; Kawabata, Itaru; and Noguchi, Teruhiko, 4,962,408, Cl. 355-245.000.

Kawada, Koji, to NEC Corporation. Semiconductor memory device having bit lines less liable to have influences of the adjacent bit lines. 4,962,476, Cl. 365-53.000.

Kawada, Shigeo: *See*—
Hatanaka, Kaoru; Miyamaru, Yukio; and Kawada, Shigeo, 4,962,366, Cl. 340-56.000.

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Nakagawa, Shin-ichi; and Kawai, Hiroyuki, 4,962,343, Cl. 307-246.000.

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Kusui, Jun; Tanaka, Akiei; and Kawai, Masahiko, 4,961,779, Cl. 75-231.000.

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Tanabe, Haruyoshi; Kawakami, Masahiro; Takahashi, Kenji; Iwasaki, Katsuhiro; and Inoue, Shigeru, 4,961,784, Cl. 75-623.000.

Kawamorita, Yoichi: *See*—
Kimura, Tomohiro; and Kawamorita, Yoichi, 4,962,008, Cl. 430-66.000.

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Kato, Yoshio; and Kawashima, Ichiro, 4,961,484, Cl. 192-3.310.

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Morishita, Masao; Kawatani, Hiroshi; and Minamide, Toshiyuki, 4,961,781, Cl. 75-244.000.

Kazman, William S.: *See*—
Pong, William; Engelberger, Joseph F.; Evans, John M.; and Kazman, William S., 4,962,453, Cl. 364-424.020.

Keegan, Patrick K. Weighted netting. 4,961,981, Cl. 428-72.000.

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Doner, John P.; Horodysky, Andrew G.; and Keller, John A., Jr., 4,961,868, Cl. 252-32.70E.

Keller, Richard A.: *See*—
Jett, James H.; Keller, Richard A.; Martin, John C.; Moyzis, Robert K.; Ratliff, Robert L.; Shera, E. Brooks; and Stewart, Carleton C., 4,962,037, Cl. 435-6.000.

Keller, Ronald J.: *See*—
Burns, Gary T.; Saha, Chandan K.; and Keller, Ronald J., 4,962,069, Cl. 501-90.000.

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Kemp, Richard A.: *See*—
Hamilton, David M., Jr.; and Kemp, Richard A., 4,962,263, Cl. 585-646.000.

Kendall Company, The: *See*—
Doheny, Anthony J., 4,961,797, Cl. 156-85.000.
Doheny, Anthony J., Jr.; and Noonan, James R., 4,961,978, Cl. 428-40.000.

Keng, Jiun G., to Enzyme Bio-Systems, Ltd. Process for the production of panosyl derivatives. 4,962,026, Cl. 435-98.000.

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Keo, Jane: *See*—
Liu, David; and Keo, Jane, 4,961,249, Cl. 24-67.300.

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Kilmer, Lauren G.; and Reynolds, Alvin E., 4,961,744, Cl. 606-166.000.

Kern, Frederick C., to Fairchild Industries, Inc. Retainer for injection molds. 4,961,702, Cl. 425-595.000.

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Gottselig, Bernd; Gyarmati, Erno ; and Naoumidis, Aristides, 4,961,529, Cl. 228-124.000.

Kestler, Joachim: *See*—
Schwierz, Guenter; and Kestler, Joachim, 4,962,513, Cl. 378-12.000.

Ketteringham, Thomas, to Martek Limited. Apparatus for sharpening edge tools. 4,961,288, Cl. 51-92.0BS.

Keyes, Brian R.: *See*—
Halm, Roland L.; Chadwick, Kirk M.; and Keyes, Brian R., 4,962,219, Cl. 556-468.000.

Khalil-Manesh, Farhad: *See*—
Gonick, Harvey C.; Khalil-Manesh, Farhad; and Weiler, Elmar W. J., 4,962,127, Cl. 514-578.000.

Khaliq, Muhammad A.: *See*—
Brown, William D.; and Khaliq, Muhammad A., 4,962,065, Cl. 437-242.000.

Khan, Khalique A., to Aerovironment, Inc. Bioremediation of organic contaminated soil and apparatus therefor. 4,962,034, Cl. 435-262.000.

Kicak, Richard J., Jr.: *See*—
Corbo, Thomas A.; Vulpitta, Brian A.; Greenleaf, Alan R.; and Kicak, Richard J., Jr., 4,961,525, Cl. 225-65.000.

Kiehn, Robert M.: *See*—
Gorman, Michael A.; Sterling, Mark H.; Kiehn, Robert M.; and Wood, Lowell T., 4,961,622, Cl. 350-96.180.

Kiely, John S.: *See*—
Hutt, Marland P., Jr.; and Kiely, John S., 4,962,108, Cl. 514-249.000.

Kiesele, Herbert: *See*—
Kuhn, Uwe; Roocks, Christiane; and Kiesele, Herbert, 4,961,834, Cl. 204-412.000.

Kigre, Inc.: *See*—
Myers, John D., 4,962,067, Cl. 501-45.000.

Kihara, Noriaki; Tomino, Ikuo; Tan, Hiroaki; and Ishihara, Takafumi, to Mitsui Petrochemical Industries, Ltd. Nitrogen-containing compound. 4,962,200, Cl. 544-333.000.

Kihira, Hiroshi: *See*—
Homma, Koji; Kihira, Hiroshi; Ito, Satoshi; Matsuoka, Kazumi; and Hirosawa, Noriyuki, 4,962,360, Cl. 324-700.000.

Kikuchi, Susumu: *See*—
Tsujiuchi, Junpei; Ikeda, Shigeto; Honda, Toshio; Ohyama, Nagaaki; Badique, Eric; and Kikuchi, Susumu, 4,962,540, Cl. 382-17.000.

Kikuchi, Yasuo: *See*—
Nemoto, Shigeo; Namikawa, Osamu; Tsuchiya, Kiyomi; Nakajima, Isao; Kikuchi, Yasuo; Sugaya, Tomio; Ogawa, Toshitaka; and Katagiri, Sigenobu, 4,961,704, Cl. 432-8.000.

Kikushima, Shigeru: *See*—
Yamaoka, Fumiyuki; Kakizaki, Shinobu; and Kikushima, Shigeru, 4,961,483, Cl. 188-299.000.

Kilmer, Lauren G.; and Reynolds, Alvin E., to Keravision, Inc. Holder for inserting corneal curvature adjustable ring. 4,961,744, Cl. 606-166.000.

Kimball, Michael E., to W. R. Grace & Co.-Conn. Reactive hot melt structural adhesive. 4,962,138, Cl. 523-428.000.

Kimberly-Clark Corporation: *See*—
Radwanski, Fred R.; Durocher, Donald F.; Chambers, Leon E., Jr.; Kasbo, Loyd G.; Cartwright, William F.; Geer, Robert G.; and Bullwinkel, Edward P., 4,961,415, Cl. 131-332.000.

Kimmel, Linda B.: *See*—
Sawhney, A. Paul S.; Folk, Craig L.; Robert, Kearny Q.; and Kimmel, Linda B., 4,961,306, Cl. 57-12.000.

Kimura, Michio: *See*—
Kanai, Takashi; Kimura, Michio; and Noguchi, Yoshio, 4,962,245, Cl. 570-211.000.

Kimura, Sadao, to Usui Kokusai Sangyo Kaisha Ltd. Small-diameter metallic conduit. 4,961,335, Cl. 72-381.000.

Kimura, Shigenobu, to Yamaha Corporation. Optical disk playback device having automatic volume control. 4,962,494, Cl. 369-48.000.

Kimura, Shinta; and Sanada, Toru, to Fujitsu Limited. Voice recognition system. 4,962,535, Cl. 381-43.000.

Kimura, Tomohiro; and Kawamorita, Yoichi, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member. 4,962,008, Cl. 430-66.000.

Kinashi, Hiroshi: *See*—
Masuda, Jitsuo; Morimoto, Junji; Yamagishi, Ken; Kinashi, Hiroshi; Kawabata, Itaru; and Noguchi, Teruhiko, 4,962,408, Cl. 355-245.000.

Kingston, Samuel C., to Unisys Corporation. Dual channel interference canceller. 4,962,508, Cl. 375-1.000.

Kinoshita, Hiroshi: *See*—
Kuge, Toru; and Kinoshita, Hiroshi, 4,962,543, Cl. 455-89.000.

Kinoshita, Mitsuo; Shimono, Toshihide; Yamaguchi, Shozo; and Yamamoto, Tsuneo, to Takemoto Yushi Kabushiki Kaisha. Cement dispersion agents comprising water soluble vinyl copolymer. 4,962,173, Cl. 526-240.000.

Kinoshita, Satoshi: *See*—
Ono, Haruo; Kinoshita, Satoshi; and Suga, Fusao, 4,962,469, Cl. 364-561.000.

Kinoshita, Yoshio; Koshino, Shigeaki; and Sakai, Yoshiaki, to NSK-Warner Kabushiki Kaisha. Retainer plate of a one-way clutch assembly. 4,961,486, Cl. 192-41.00R.

Kishida, Koji; and Akisue, Osamu, to Nippon Steel Corporation. High-strength cold-rolled steel sheet having high r value and process for manufacturing the same. 4,961,793, Cl. 148-12.00C.

Kishino, Kazuo: *See*—
Kita, Yuichi; Kishino, Kazuo; and Fukui, Akio, 4,962,205, Cl. 548-549.000.

Kisner, Richard L. Combination step bumper and hoist apparatus. 4,961,604, Cl. 293-106.000.

Kita, Yuichi; Kishino, Kazuo; and Fukui, Akio, to Nippon Shokubai Kagaku Kogyo, Co., Ltd. Method for transportation and storage of N-phenyl maleimide in molten form. 4,962,205, Cl. 548-549.000.

Kitagawa, Kiyoshi; Hosoi, Yoshio; Sogawa, Akira; Onodera, Chikau; and Onuma, Tadashi, to Kureha Kagaku Kogyo Kabushiki Kaishi. High-frequency capacitive heating electrode device. 4,961,435, Cl. 128-788.000.

Kitahara, Tsuyoshi; Yonekubo, Shuji; Morozumi, Hideki; Higashimura, Koichi; and Matsuzawa, Masanao, to Seiko Epson Corporation. Ink jet printer head. 4,962,391, Cl. 346-140.00R.

Kitamura, Taku; Kurokawa, Noriko; and Takahashi, Katsuji, to Dainippon Ink and Chemicals, Inc. Method for symmetrically dimerizing phenols and process for producing biphenols. 4,962,240, Cl. 568-730.000.

Kiuchi, Akihiro, to Sharp Kabushiki Kaisha. Step-up circuit. 4,962,512, Cl. 377-78.000.

Klaczak, Lynne D.; and Stair, Mark T., to Motorola, Inc. Volume level retention in a pager. 4,962,545, Cl. 455-200.000.

Kleefeld, Gerd; and Dutzmann, Stefan, to Bayer Aktiengesellschaft. Fungicidal substituted triazoles. 4,962,118, Cl. 514-383.000.

Klees, Kevin J., to Eastman Kodak Company. Method for reducing artifacts in error diffused images. 4,962,542, Cl. 382-54.000.

Klein, Andre. Process and apparatus for molding structures comprising longitudinally juxtaposed slats. 4,961,895, Cl. 264-40.600.

Klein, Rita R.. Identification badge. 4,961,275, Cl. 40-1.500.

Klein, William L.: *See*—
Chromecek, Richard C.; Sojka, Milan F.; Klein, William L.; and Carmody, Walter J., 4,962,133, Cl. 521-56.000.

Kleinschmit, Peter: *See*—
Witzel, Michael; Kleinschmit, Peter; Pfeifer, Wolf-Dieter; Voigt, Carl; and Albers, Peter, 4,961,914, Cl. 423-376.000.

Klein, Rudolf; and Ziegler, Gerd, to W. L. Gore & Associates, Inc. Device for testing articles of clothing for waterproofness. 4,961,339, Cl. 73-73.000.

Klessig, Clarence E.: *See*—
Buccicone, Dana F.; Gaffney, Thomas E.; Klessig, Clarence E.; and Weir, Alan J., 4,961,443, Cl. 137-315.000.

Klier, Eric; Mortensen, Andreas; Cornie, James A.; and Flemings, Merton C., to Massachusetts Institute of Technology. Method and apparatus for continuous casting of composites. 4,961,461, Cl. 164-461.000.

Klingamen, Allen: *See*—
Hull, Harold L.; and Klingamen, Allen, 4,961,849, Cl. 210-169.000.

Klink, Jerome P.: *See*—
Miller, William R.; and Klink, Jerome P., 4,961,769, Cl. 65-4.400.

Klosowski, Jerome M.: *See*—
Chu, Hsien-Kun; Kamis, Russell P.; Klosowski, Jerome M.; and Lower, Loren D., 4,962,076, Cl. 502-158.000.

Kluger, Edward W.: *See*—
Migdal, Cyril A.; Hines, John B.; and Kluger, Edward W., 4,962,142, Cl. 524-100.000.

Kneebone, Ken L.; and Head, James E. Universally adaptable, hinged hatch cover system for railroad hopper cars. 4,961,387, Cl. 105-377.000.

Knesel, Ernest A., Jr.; Shoemaker, Daniel R.; and Fansler, David V., to Hoffmann-La Roche Inc. Test tube filter/dispenser apparatus and method. 4,962,044, Cl. 436-177.000.

Knox, John A.: *See*—
Himes, Ronald E.; and Knox, John A., 4,961,466, Cl. 166-250.000.

Kobayashi, Kazuyuki; and Hayashi, Shunichi, to Mitsubishi Jukogyo Kabushiki Kaisha. Control apparatus for an engine. 4,961,409, Cl. 123-376.000.

Kobayashi, Masao; and Otsuka, Reiko, to Showa Denko Kabushiki Kaisha. Radical polymerizable composition containing a compound having pi-electron conjugated structure. 4,962,158, Cl. 525-279.000.

Kobayashi, Shouzo; Takagi, Hiroshi; and Sakabe, Yukio, to Murata Manufacturing Co., Ltd. Solid electrolyte, sensor therewith and method of making said sensor. 4,961,835, Cl. 204-427.000.

Kobayashi, Takeo: *See*—
Numako, Norio; and Kobayashi, Takeo, 4,962,399, Cl. 354-195.100.

Kobayashi, Tatsunori: *See*—
Kojima, Tatsuo; Kobayashi, Tatsunori; Katou, Kouki; Ohba, Tetsuya; Yatsuzuka, Takashi; and Tanabe, Koji, 4,961,261, Cl. 29-895.210.

Kobayashi, Tomoya: *See*—
Abe, Kunihiro; and Kobayashi, Tomoya, 4,962,456, Cl. 364-431.010.

Kobayashi, Toshifumi: *See*—
Yasuda, Kenichi; Kobayashi, Toshifumi; and Yamada, Michihiro, 4,962,379, Cl. 340-825.510.

Kobayashi, Yutaka: *See*—
Asayama, Kyoichiro; Miyazawa, Hiroyuki; Kobayashi, Yutaka; and Yukutake, Seigou, 4,962,052, Cl. 437-31.000.

Koch, David N.: *See*—
Koch, Thomas P.; and Koch, David N., 4,961,583, Cl. 273-260.000.

Koch, James P., to Brigham and Women's Hospital. Contraceptive cervical cap. 4,961,436, Cl. 128-837.000.

Koch, Rudolf: *See*—
Frey, Otto; and Koch, Rudolf, 4,961,748, Cl. 623-22.000.

Koch, Thomas P.; and Koch, David N. Apparatus for playing checkers. 4,961,583, Cl. 273-260.000.

Kodama, Hiromitsu: *See*—
Fujiura, Yoshitsugu; Ishikawa, Shigeru; and Kodama, Hiromitsu, 4,961,711, Cl. 439-357.000.

Koeffer, Dieter: *See*—
Roeper, Michael; Bertleff, Werner; and Koeffer, Dieter, 4,962,243, Cl. 568-909.500.

Koeppe, Paul F.: *See*—
Visser, Age T.; Trendler, Robert C.; and Koeppe, Paul F., 4,962,354, Cl. 323-360.000.

Koerber, Clement J., Sr., to Hill-Rom Company, Inc. Weigh bed having vertical load link. 4,961,470, Cl. 177-144.000.

Koga, Toshiyuki, to Seiko Instruments Inc. Automatic X-ray correction device. 4,962,517, Cl. 378-48.000.

Kogure, Yoshio, to Eisai Co., Ltd. Clear solution containing lysozyme hydrochloride and dipotassium glycyrrhizinate. 4,961,927, Cl. 424-94.300.

Kohl, Peter: *See*—
Wullenweber, Heinz; Kohl, Peter; Jung, Herbert; Borchardt, Jorgen; Bickle, Wolfgang; Braus, Jurgen; and Hiedemann, Hans-Joachim, 4,961,901, Cl. 419-2.000.

Kohler Co.: *See*—
Buccicone, Dana F.; Gaffney, Thomas E.; Klessig, Clarence E.; and Weir, Alan J., 4,961,443, Cl. 137-315.000.

Kohler, Saskia: *See*—
Demus, Dietrich; Zaschke, Horst; Weissflog, Wolfgang; Mohr, Kristina; Kohler, Saskia; and Worm, Kerstin, 4,961,876, Cl. 252-299.670.

Koichi, Yasushi: *See*—
Sohmiya, Norimasa; Koichi, Yasushi; and Karasawa, Kazunori, 4,962,394, Cl. 346-160.100.

Koizumi, Norihiko: *See*—
Kan, Fumitaka; Tamura, Yasuyuki; Kushida, Naoki; Tohma, Koichi; Fukumoto, Hiroshi; Yuasa, Toshiya; Tohyama, Noboru; and Koizumi, Norihiko, 4,962,389, Cl. 346-140.00R.

Kojima, Tatsuo; Kobayashi, Tatsunori; Katou, Kouki; Ohba, Tetsuya; Yatsuzuka, Takashi; and Tanabe, Koji, to Nippon Steel Corporation; and Mitsubishi Kinzoku Kabushiki Kaisha. Roll for mill and method of making a roll for a mill. 4,961,261, Cl. 29-895.210.

Kokubun, Kozo, to Fuji Photo Film Co., Ltd. Single lock switch for inputting commands associated with shooting in movie camera. 4,962,396, Cl. 352-174.000.

Komatsu, Fumiaki; Sakamoto, Junichi; Fujimoto, Hitoshi; Ohtsuka, Hiroshi; Saiguaa, Kazuyuki; Kabasawa, Akifumi; Yokodate, Shinya; and Kashiwagi, Kenichi, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for still picture video telephone apparatus and methods for transmitting and displaying still picture image for use therein. 4,962,521, Cl. 379-53.000.

Komatsu, Yasuhiro, to Hosiden Electronics Co., Ltd. Memory card connector. 4,961,710, Cl. 439-267.000.

Komurasaki, Satoshi, to Mitsubishi Denki Kabushiki Kaisha. Vibration detecting device. 4,961,338, Cl. 73-35.000.

Kondo, Masahiro: *See*—
Kawasaki, Satoru; and Kondo, Masahiro, 4,962,315, Cl. 250-336.100.
Miyake, Akio; Kondo, Masahiro; and Fujino, Masahiko, 4,962,100, Cl. 514-202.000.

Kondo, Mitsunobu: *See*—
Kotani, Matahira; Matsumoto, Masafumi; Fujii, Mamoru; Hayashi, Motohiko; Hachinoda, Masayuki; Kondo, Mitsunobu; Murata, Naomitsu; and Mino, Kouichi, 4,962,526, Cl. 379-100.000.

Kondo, Shigeru; Takatori, Naoki; Morizumi, Masaaki; and Kanamori, Shino, to Fuji Photo Film Co., Ltd. Zoom lens drive mechanism. 4,961,635, Cl. 350-429.000.

Konica Corporation: *See*—
Asano, Masao; Matsuzawa, Yumi; Sekimoto, Mutsumi; Koshizuka, Kunihiro; Tezuka, Toshiaki; and Abe, Takao, 4,961,997, Cl. 428-423.100.
Chino, Shigeo; and Okumura, Mitsuhiro, 4,962,016, Cl. 430-603.000.
Uehara, Masafumi; Nogami, Akira; Shimura, Kazuhiro; Yumiki, Keiichi; and Iwaki, Akio, 4,961,859, Cl. 210-725.000.

Kopans, Daniel B., to General Hospital Corporation, The. Ridged compression assembly for mammography apparatus. 4,962,515, Cl. 378-37.000.

Kopatz, Nelson E.: *See*—
Johnson, Walter A.; Kopatz, Nelson E.; and Pruyne, Lori S., 4,961,770, Cl. 65-21.300.

Koros, Robert M.: *See*—
Bhagat, Phiroz M.; and Koros, Robert M., 4,961,882, Cl. 261-124.000.

Korotky, Steven K.: *See*—
Hernandez-Gil, Jose F.; Korotky, Steven K.; Murphy, Timothy O.; and Veselka, John J., 4,961,619, Cl. 350-96.120.

Korte, Steven J., to Brown & Williamson Tobacco Corporation. Smoking device. 4,961,438, Cl. 131-360.000.

Kosaka, Toru: *See*—
Otani, Tadashi; Meguro, Hiroshi; and Kosaka, Toru, 4,962,400, Cl. 354-195.100.

Kosch, Paul, Sr.; and Kosch, Paul J. Metal slat and wall system utilizing same. 4,961,295, Cl. 52-36.000.

Kosch, Paul J.: *See*—
Kosch, Paul, Sr.; and Kosch, Paul J., 4,961,295, Cl. 52-36.000.

Koseki, Junichi: *See*—
Hiroki, Masashi; Koseki, Junichi; and Todome, Tuyoshi, 4,962,430, Cl. 358-296.000.

Koshino, Shigeaki: *See*—
Kinoshita, Yoshio; Koshino, Shigeaki; and Sakai, Yoshiaki, 4,961,486, Cl. 192-41.00R.

Koshizuka, Kunihiro: *See*—
Asano, Masao; Matsuzawa, Yumi; Sekimoto, Mutsumi; Koshizuka, Kunihiro; Tezuka, Toshiaki; and Abe, Takao, 4,961,997, Cl. 428-423.100.

Kosinski, Anthony J., to Becton, Dickinson and Company. Single-use syringe having misuse resistant features. 4,961,728, Cl. 604-110.000.

Kosuda, Hiroyuki; Nagata, Yasuhisa; and Andoh, Masato, to Toho Rayon Co., Ltd. Resin composition of thermosetting resin and thermoplastic resin. 4,962,162, Cl. 525-422.000.

Kotani, Matahira; Matsumoto, Masafumi; Fujii, Mamoru; Hayashi, Motohiko; Hachinoda, Masayuki; Kondo, Mitsunobu; Murata, Naomitsu; and Mino, Kouichi, to Nippon Telegraph; and Telephone Corporation & Sharp Kabushiki Kaisha. Image data transmission apparatus. 4,962,526, Cl. 379-100.000.

Kounosu, Naohiro: *See*—
Tsuruoka, Michihiko; Nakagawa, Wataru; Machida, Masashi; and Kounosu, Naohiro, 4,961,345, Cl. 73-32.00A.

Koyama, Hiroshi: *See*—
Nishioka, Tadashi; Mashiko, Yoji; Morimoto, Hiroaki; and Koyama, Hiroshi, 4,962,059, Cl. 437-189.000.

Koyama, Masao: *See*—
Sakai, Tadashi; Uno, Shigeki; Koyama, Masao; and Nakamura, Nanao, 4,961,833, Cl. 204-403.000.

Koyo Seiko Co., Ltd.: *See*—
Daido, Toshihiko; Matsuoka, Hirofumi; and Tabuse, Hidetoshi, 4,961,474, Cl. 180-79.100.

Kramer, Pieter; and Roos, Jan, to U.S. Philips Corporation. Record carrier with a follow-on track and apparatus for recording information thereon. 4,962,493, Cl. 369-44.110.

Kraus, Menahem: *See*—
Pemawansa, Kanyawasam P. W.; Heisler, Mark; and Kraus, Menahem, 4,961,852, Cl. 210-490.000.

Kreiser, Paul D., to International Business Machines Corporation. LSSD edge detection logic for asynchronous data interface. 4,962,474, Cl. 364-900.000.

Kresse, Franz; Osberghaus, Rainer; Scheller, Bernfrid; Schunter, Roland; and Tuchermann, Herta, to Henkel Kommanditgesellschaft auf Aktien. Wet mop head for floor mop. 4,961,242, Cl. 15-228.000.

Kriman, Alfred M.; and Bernstein, Gary H., to Arizona Board of Regents. QUADFET-A novel field effect transistor. 4,962,410, Cl. 357-22.000.

Krinski, Thomas L.; Tran, Tam H.; and Gambaro, Jeffrey J., to Protein Technologies International, Inc. Adhesive binders for paper coating composition having improved stability and whiteness. 4,961,788, Cl. 106-154.000.

Kronenberger, Ronald M.: *See*—
Badillo, Paul; and Kronenberger, Ronald M., 4,961,572, Cl. 273-75.000.

Krueger, Steven D.; Branstad, Martha A.; and Walker, Stephen T., to Texas Instrument Incorporated. Data protection for computer systems. 4,962,533, Cl. 380-25.000.

Kruska, Michael: *See*—
Fornoff, Karl-Heinz; and Kruska, Michael, 4,961,394, Cl. 114-266.000.

Ksander, Gary M.; and Zimmerman, Mark B., to Ciba-Geigy Corporation. Potentiation of antihypertensive effect of ace inhibitors. 4,962,105, Cl. 514-212.000.

Kubo, Kazuhiro: *See*—
Nakamura, Joji; Kubo, Kazuhiro; Ichikawa, Shunji; Takahashi, Hajime; Isozumi, Keisuke; and Yamada, Toyofumi, 4,962,107, Cl. 514-237.500.

Kubo, Nobuaki: *See*—
Imakawa, Susumu; Takeyama, Yoshinobu; Kubo, Nobuaki; and Saitoh, Masanori, 4,962,431, Cl. 358-296.000.

Kubota, Ltd.: *See*—
Takashima, Akira, 4,961,371, Cl. 91-530.000.

Kubota, Tatsuya; Gotanda, Masakazu; Hatta, Shinji; Karasawa, Hitoshi; Kubota, Tetsumaru; Nakamura, Takeaki; Takayama, Syuichi; and Sasaki, Hiroshi, to Olympus Optical Co., Ltd. Ultrasonic treatment device. 4,961,424, Cl. 128-24.00A.

Kubota, Tetsumaru: *See*—
Kubota, Tatsuya; Gotanda, Masakazu; Hatta, Shinji; Karasawa, Hitoshi; Kubota, Tetsumaru; Nakamura, Takeaki; Takayama, Syuichi; and Sasaki, Hiroshi, 4,961,424, Cl. 128-24.00A.

Kuchelmeister, Ulrich L.: *See*—
Huff, Martin; and Kuchelmeister, Ulrich L., 4,961,485, Cl. 192-4.00A.

Kuchta, Richard, to Gerber Garment Technology, Inc. Escapement mechanism for gravity fed trolleys with trolley accelerating capability. 4,961,386, Cl. 104-250.000.

Kudo, Toshiaki: *See*—
Horikoshi, Koki; Kudo, Toshiaki; and Kato, Chiaki, 4,962,055, Cl. 435-252.800.

Kuge, Toru; and Kinoshita, Hiroshi, to Kabushiki Kaisha Toshiba. Battery rundown protection system for an automobile having a radio telephone apparatus with an automatic answering function. 4,962,543, Cl. 455-89.000.

Kuhlmann, Werner: *See*—
Ott, Heidrun; and Kuhlmann, Werner, 4,962,134, Cl. 523-109.000.

Kuhn, Uwe; Roocks, Christiane; and Kiesele, Herbert, to Dragerwerk Aktiengesellschaft. Electrochemical measuring cell for amperometrically determining ammonia and derivatives thereof. 4,961,834, Cl. 204-412.000.

Kulp, Rodney, to Pilling Co. Hemostatic clip cartridge. 4,961,499, Cl. 206-339.000.

Kumar, G. Sudesh: *See*—
Goldberg, Eugene P.; Burns, James W.; Kumar, G. Sudesh; Osborn, David C.; Larson, Jeffrey A.; Sheets, John W.; Yahiaoui, Ali; and Robinson, Richard, 4,961,954, Cl. 427-2.000.

Kumar, Virendra: *See*—
Bailey, Denis M.; and Kumar, Virendra, 4,962,120, Cl. 514-399.000.

Kumazawa, Satoru: *See*—
Enari, Hiroyuki; Kumazawa, Satoru; Shimizu, Susumu; Ito, Atsushi; Sato, Nobuo; and Saishojo, Toshihide, 4,962,278, Cl. 514-399.000.

Kumobayashi, Hidenori: *See*—
Takaya, Hidemasa; Ohta, Tetsuo; Noyori, Ryoji; Sayo, Noboru; Kumobayashi, Hidenori; and Akutagawa, Susumu, 4,962,230, Cl. 562-433.000.

Yamada, Nobuo; Takezawa, Toshiyuki; Sayo, Noboru; Yagi, Misao; Kumobayashi, Hidenori; Akutagawa, Susumu; Takaya, Hidemasa; Inoue, Shinichi; and Noyori, Ryoji, 4,962,242, Cl. 568-822.000.

Kung, George M.: *See*—
Way, Edward A.; and Kung, George M., 4,961,674, Cl. 408-14.000.

Kuno, Hironari: *See*—
Tokura, Norihito; Kuno, Hironari; Ito, Hiroyasu; Saito, Hirohiko; and Hara, Kunihiko, 4,962,411, Cl. 357-23.400.

Kunze, Norbert, to U.S. Philips Corporation. Magnetic head mounting plate with tape movement limiting surface. 4,962,438, Cl. 360-130.210.

Kureha Kagaku Kogyo K.K.: *See*—
Satake, Yoshikatsu; Yamamoto, Shinji; Kaneko, Takashi; Tada, Masahito; Kashiwadate, Ken; Mizuno, Toshiya; Endo, Hiroyuki; Katto, Takayuki; and Shiiki, Zenya, 4,962,143, Cl. 524-100.000.
Toda, Fumio, 4,962,274, Cl. 585-833.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Enari, Hiroyuki; Kumazawa, Satoru; Shimizu, Susumu; Ito, Atsushi; Sato, Nobuo; and Saishojo, Toshihide, 4,962,278, Cl. 514-399.000.

Kureha Kagaku Kogyo Kabushiki Kaishi: *See*—
Kitagawa, Kiyoshi; Hosoi, Yoshio; Sogawa, Akira; Onodera, Chikau; and Onuma, Tadashi, 4,961,435, Cl. 128-788.000.

Kurihara, Norimitsu; Asakura, Masahiko; Anzai, Hidehiko; and Matsui, Mitsuru, to Honda Giken Kogyo Kabushiki Kaisha; and Mitsuba Electric Manufacturing Co., Ltd. Cruise control system. 4,961,475, Cl. 180-179.000.

Kuroda, Hiroshi: *See*—
Hirano, Shinichi; Toyokuni, Ryo; and Kuroda, Hiroshi, 4,961,823, Cl. 156-623.00R.

Kuroda, Kouji: *See*—
Itoh, Kazuhito; Fujimoto, Katsumi; and Kuroda, Kouji, 4,961,669, Cl. 403-359.000.

Kurokawa, Noriko: *See*—
Kitamura, Taku; Kurokawa, Noriko; and Takahashi, Katsuji, 4,962,240, Cl. 568-730.000.

Kusayanagi, Masao: *See*—
Jingu, Toshihiro; and Kusayanagi, Masao, 4,961,657, Cl. 400-599.000.

Kushida, Naoki: *See*—
Kan, Fumitaka; Tamura, Yasuyuki; Kushida, Naoki; Tohma, Koichi; Fukumoto, Hiroshi; Yuasa, Toshiya; Tohyama, Noboru; and Koizumi, Norihiko, 4,962,389, Cl. 346-140.00R.

Kushner, Gerald: *See*—
Wascher, Uwe; Mostwin, Jacek L.; Belden, Lorne, Jr.; and Kushner, Gerald, 4,961,747, Cl. 623-12.000.

Kuss Corporation: *See*—
Combest, John F., 4,961,850, Cl. 210-232.000.

Kusui, Jun; Tanaka, Akiei; and Kawai, Masahiko, to Toyo Aluminium Kabushiki Kaisha. Aluminum composite material. 4,961,779, Cl. 75-231.000.

Kusumoto, Akio: *See*—
Ikenaga, Takao; Shigematsu, Toshifumi; Kusumoto, Akio; Yamamoto, Kimiyoshi; and Yada, Masatoshi, 4,961,431, Cl. 128-760.000.

Kutz, Nancy A.: *See*—
Amelse, Jeffrey A.; Donohue, John A.; Kutz, Nancy A.; Melville, Judith B.; and Slusar, Brian L., 4,962,258, Cl. 585-480.000.

Kvisle, Steinar: *See*—
De Clippeleir, Georges E. M. J.; Ofstad, Elizabeth B.; and Kvisle, Steinar, 4,962,265, Cl. 585-660.000.

Kvita, Petr: *See*—
Bruttel, Beat; and Kvita, Petr, 4,961,755, Cl. 8-526.000.

Kwak, Yoon T.: *See*—
Tazi, Mohammed; Kwak, Yoon T.; and Plochocka, Krystyna, 4,962,185, Cl. 528-497.000.

Kyowa Hakko Kogyo, Co., Ltd.: *See*—
Kase, Hiroshi; Matauda, Yuzuru; Shirahata, Kunikatsu; Yasuzawa, Toru; and Yamada, Koji, 4,962,125, Cl. 514-569.000.
Tsujino, Yoshio; Yokoo, Yoshiharu; Sakato, Kuniaki; and Hagino, Hiroshi, 4,961,925, Cl. 424-71.000.
Yoshida, Hajime; Hanai, Nobuo; and Furuya, Akiko, 4,962,032, Cl. 435-240.270.

Kyowa Hakko Kogyo Kabushiki Kaisha: *See*—
Nakamura, Joji; Kubo, Kazuhiro; Ichikawa, Shunji; Takahashi, Hajime; Isozumi, Keisuke; and Yamada, Toyofumi, 4,962,107, Cl. 514-237.500.

Labaw, Glen: *See*—
Blanthorn, Michele; and Labaw, Glen, 4,961,943, Cl. 426-102.000.

Labofina, S.A.: *See*—
Braeken, Jozef; Dekerk, Jean-Paul; van der Poel, Hendrik; Verborgt, Jozef; and Haak, Peter, 4,962,135, Cl. 523-122.000.
De Clippeleir, Georges E. M. J.; Ofstad, Elizabeth B.; and Kvisle, Steinar, 4,962,265, Cl. 585-660.000.

Labombarde, Raymond A., deceased (by Labombarde, Ruth N., Nashua Trust Company, executors), to International Paper Box Machine Co., Inc. Apparatus for feeding sheets from a stack of sheets. 4,961,566, Cl. 271-35.000.

Labombarde, Ruth N., Nashua Trust Company, executors: *See*—
Labombarde, Raymond A., deceased, 4,961,566, Cl. 271-35.000.

Lackey, Donald V., to Dunmore Corporation. Microwave susceptor film to control the temperature of cooking foods. 4,962,293, Cl. 219-10.55E.

Lagassee, Richard L. Glass holder tool. 4,961,291, Cl. 51-217.00P.

Laibowitz, Robert B.: *See*—
Gallagher, William J.; Giess, Edward A.; Gupta, Aranava; Laibowitz, Robert B.; O'Sullivan, Eugene J.; and Sandstrom, Robert L., 4,962,086, Cl. 505-1.000.

Laitinen, Leo S.; and Waris, Veikko K. T. Method for manufacturing multilayer board. 4,961,824, Cl. 162-123.000.

Lakshmanasamy, S.: *See*—
Jordan, Arthur K.; and Lakshmanasamy, S., 4,961,618, Cl. 350-96.120.

Lalo, Jack: *See*—
Garrigue, Roger; and Lalo, Jack, 4,962,182, Cl. 528-230.000.

Lamb, Steven: *See*—
Moore, Robert; and Lamb, Steven, 4,961,416, Cl. 128-80.00C.

Lambert, Susan L.: *See*—
Sachtler, Johann W. A.; Lawson, Randy J.; and Lambert, Susan L., 4,962,259, Cl. 585-480.000.

Lammons, Carl S.: *See*—
Cawthron, Derrick; Woods, Robert L.; Story, James B.; Lammons, Carl S.; and Murray, Donald W., 4,961,605, Cl. 293-128.000.

Landis, Daryl D.: *See*—
Huntress, Arnold R.; Landis, Daryl D.; McVannel, Donald E.; and Allen, Timothy, 4,962,221, Cl. 556-456.000.

Lang, Franz J., to Display-Design GmbH fur moderne Verkaufsforderungsmittel und Raumausstattung. Multi-tier tower for goods display. 4,961,506, Cl. 211-188.000.

Lange International S. A.: *See*—
Bidoia, Vincenzo, 4,961,544, Cl. 242-54.00R.

Langeneckert, Hermann, to Luk Lamellen und Kupplungsbau GmbH. Vibration damping apparatus. 4,961,487, Cl. 192-106.200.

LaPierre, Rene B.; Partridge, Randall D.; and Wong, Stephen S., to Mobil Oil Corporation. Isomerization process. 4,962,269, Cl. 585-739.000.

Lapray, Danny K., to Clear Springs Trout Company. Rotating brush aeration system. 4,961,400, Cl. 119-3.000.

Larom, Dov: *See*—
Avrahami, Zohar; Larom, Dov; Zucker, Shlomo; and Gross, Joseph, 4,961,885, Cl. 261-142.000.

Larson, Curtis L.: *See*—
Emslander, Jeffrey O.; Larson, Curtis L.; and Lepere, Pierre H., 4,962,000, Cl. 428-461.000.

Larson, Jeffrey A.: *See*—
Goldberg, Eugene P.; Burns, James W.; Kumar, G. Sudesh; Osborn, David C.; Larson, Jeffrey A.; Sheets, John W.; Yahiaoui, Ali; and Robinson, Richard, 4,961,954, Cl. 427-2.000.

Larson, Merle A., to Cannon Equipment Company. Double strength pegbar. 4,961,504, Cl. 211-59.100.

Larsson, Bernt: *See*—
Andersson, Kjell R.; Larsson, Bernt; Thoresson, Hans-Olof; and Larsson, Bo V., 4,961,825, Cl. 162-175.000.

Larsson, Bo V.: *See*—
Andersson, Kjell R.; Larsson, Bernt; Thoresson, Hans-Olof; and Larsson, Bo V., 4,961,825, Cl. 162-175.000.

Larsson, Kenneth L.; and Liljebrand, Sven P., to Sandvik AB. Drill string element. 4,961,469, Cl. 173-163.000.

LaRue, Albert M., to B. F. Goodrich Company, The. Asymmetrical pneumatic deicer. 4,961,549, Cl. 244-134.00A.

Laser Magnetic Storage International Company: *See*—
Mathildus, Gerardus L.; Hecht, Matthew W.; and Briones, Robert A., 4,962,492, Cl. 369-13.000.

Laska, Eugene M.: *See*—
Sunshine, Abraham; and Laska, Eugene M., 4,962,124, Cl. 514-568.000.

Latella, Joseph: *See*—
Singer, Norman S.; Latella, Joseph; and Shoji, Yamamoto, 4,961,953, Cl. 426-656.000.

La Torre, Paolo: *See*—
Cappa, Giulio; Moscatelli, Romano; and La Torre, Paolo, 4,961,420, Cl. 128-207.120.

Laudan, Horst: *See*—
Van Hoof, Leonardus; Mateika, Dieter; Laudan, Horst; Pistorius, Johannes; and Haisma, Jan, 4,961,919, Cl. 423-598.000.

Laugal, Ruth Carol O.: *See*—
Micheli, Adolph L.; Dungan, Dennis F.; Hamdi, Aboud H.; Mantese, Joseph V.; and Laugal, Ruth Carol O., 4,962,088, Cl. 505-1.000.

Lausberg, Dietrich: *See*—
Taubitz, Christof; Seiler, Erhard; Boehlke, Klaus; and Lausberg, Dietrich, 4,962,157, Cl. 525-132.000.

Lautenschlager, Eugene P.: *See*—
Coutts, Garry D.; Lautenschlager, Eugene P.; Wixson, Richard L.; and Novak, Michael A., 4,961,647, Cl. 366-139.000.

Lavenir Technology, Inc.: *See*—
Henzi, Max P.; and Matoic, Marius, 4,962,464, Cl. 364-518.000.

Law, Chi C.; and Russell, Scott M., to United Technologies Corporation. Nickel aluminide materials having toughness and ductility at low temperatures. 4,961,905, Cl. 420-460.000.

Lawlis, Virgil B.: *See*—
Hayenga, Kirk J.; Lawlis, Virgil B.; and Snedecor, Bradley R., 4,961,938, Cl. 426-36.000.

Lawrence, Virginia M. Eyebrow shaving apparatus. 4,961,262, Cl. 30-32.000.

Lawson, Randy J.: *See*—
Sachtler, Johann W. A.; Lawson, Randy J.; and Lambert, Susan L., 4,962,259, Cl. 585-480.000.

Laycock, David E., to Dow Chemical Company, The. Catalytic process for the preparation of polyols. 4,962,237, Cl. 568-618.000.

Laycock, David E., to Dow Chemical Company, The. Synthesis of stereoregular poly(propylene oxide). 4,962,281, Cl. 528-413.000.
Lazarus, Conrad: *See—*
Riedl, Reinhold; and Lazarus, Conrad, 4,961,680, Cl. 414-458.000.
Lazarus, Stuart M. Prism section lens spectacles. 4,961,639, Cl. 351-41.000.
Le, Quang N.; Marler, David O.; McWilliams, John P.; Rubin, Mae K.; Shim, Joosup; and Wong, Stephen S., to Mobil Oil Corp. Process for preparing long chain alkyl aromatic compounds. 4,962,256, Cl. 585-467.000.
Leandri, Jacqueline: *See—*
Rey, Pierre; Leandri, Jacqueline; and Abbou, Clement, 4,961,725, Cl. 600-31.000.
Lear Siegler Commercial Products Corp.: *See—*
Simpson, Danny, 4,961,388, Cl. 108-42.000.
Leas, James M.: *See—*
Beckham, Keith F.; Challener, David C.; Gupta, Arunava; Harvilchuck, Joseph M.; Leas, James M.; Lloyd, James R.; Long, David C.; Quinones, Horatio; Seshan, Krishna; and Shatzkes, Morris, 4,962,294, Cl. 219-121.680.
Lebisch, Helmut: *See—*
Basel, Rainer; and Lebisch, Helmut, 4,962,537, Cl. 381-68.600.
LeCompte, George W., to Hughes Aircraft Company. Deep nested filament winding. 4,961,545, Cl. 242-54.00R.
Leder, Philip; Shimizu, Akira; Siraganian, Reuben; and Benfey, Philip, to President and Fellows of Harvard College. DNA encoding IgE receptor alpha-subunit or fragment thereof. 4,962,035, Cl. 435-320.000.
Ledis, Stephen L.: *See—*
Carter, James H.; Ledis, Stephen L.; and Crews, Harold R., 4,962,038, Cl. 436-10.000.
Lee, Jim P., to Her Majesty the Queen as represented by the Minister of National Defence of Her Majesty's Canadian Government. Modified multi-channel Bragg cell using a phased array structure for the improvement of overall efficiency. 4,962,382, Cl. 342-372.000.
Lee, Ming-Hsiang. Juicer. 4,961,374, Cl. 99-507.000.
Lee, Pei-ing P.: *See—*
Cronin, John E.; and Lee, Pei-ing P., 4,962,058, Cl. 437-187.000.
Lee, Shih-Ye. Drying apparatus. 4,961,272, Cl. 34-90.000.
Lee, Soo-Chul: *See—*
Choi, Jung-Hyuk; Lee, Soo-Chul; and Yim, Hyung-Kyu, 4,962,481, Cl. 365-185.000.
Lee, Suh Y.: *See—*
Whitlow, Graham A.; and Lee, Suh Y., 4,961,390, Cl. 110-246.000.
Leempoel, Patrick, to Dow Corning S. A. Curable filled polysiloxane compositions. 4,962,152, Cl. 524-788.000.
Leger, Serge: *See—*
Young, Robert N.; Williams, Haydn W. R.; Leger, Serge; Frenette, Richard; and Zamboni, Robert, 4,962,203, Cl. 546-180.000.
LeGoues, Francoise K.: *See—*
Hodgson, Rodney T.; LeGoues, Francoise K.; and Wells, Oliver C., 4,962,306, Cl. 250-310.000.
LeGrow, Gary E.: *See—*
Bujalski, Duane R.; LeGrow, Gary E.; and Lim, Thomas F., 4,962,175, Cl. 528-19.000.
Leibman, Faith H. Outergarment with detachable crotch piece. 4,961,234, Cl. 2-234.000.
Leitmeier, Klaus: *See—*
Woss, Gerhard; and Leitmeier, Klaus, 4,962,328, Cl. 307-491.000.
Leitzel, James A.; and Snyder, Wesley H., to Metal Industries, Inc. Balancing arrangement for double hung windows. 4,961,247, Cl. 16-197.000.
Lejus, Anne-Marie: *See—*
Aubert, Jean-Jacques; Lejus, Anne-Marie; Viana, Bruno; and Vivien, Daniel, 4,962,504, Cl. 372-41.000.
Lemmons, Gerald E.: *See—*
Burlock, Charleton D.; Lemmons, Gerald E.; and Williams, David W., 4,961,947, Cl. 426-482.000.
Lemonier, Michel G., to U.S. Philips Corporation. Television camera having an increased resolution in a portion of the field of view. 4,962,429, Cl. 358-213.130.
Lenoir, Roland: *See—*
Butler, David R.; Snow, George; Sandford, Philip; Neu, Max G.; Villani, Jean P.; Teyssedre, Alain; and Lenoir, Roland, 4,961,460, Cl. 164-134.000.
Leonard, Donald A.; and Sweeney, Harold E., to GTE Government Systems Corporation. Remote subsurface water temperature measuring apparatus with Brillouin scattering. 4,962,319, Cl. 250-574.000.
Leonhartsberger, Heinrich, to Engel Maschinenbau Gesellschaft m.b.H. Closing mechanism for an injection molding machine. 4,961,372, Cl. 92-108.000.
Lepere, Pierre H.: *See—*
Emslander, Jeffrey O.; Larson, Curtis L.; and Lepere, Pierre H., 4,962,000, Cl. 428-461.000.
Lesage, Jacques; and Perrault, Guy, to IRSST-Institut de Recherche en Sante et en Securite du Travail du Quebec. Sampling device. 4,961,916, Cl. 422-88.000.
Leung, Emily W.: *See—*
Lierke, Ernst G.; Leung, Emily W.; and Bhat, Balakrishna T., 4,962,330, Cl. 310-323.000.
Levenson, Corey; Chang, Chu-an; and Oakes, Fred T., to Cetus Corporation. Covalent oligonucleotide-horseradish peroxidase conjugate. 4,962,029, Cl. 435-192.000.
Lever Brothers Company: *See—*
Kenyon, Ian R.; and Smith, Bryan C., 4,961,866, Cl. 252-8.600.
Levy, Moshe: *See—*
Fraenkel, Dan; Levy, Moshe; Ittah, Baruch; and Cherniavsky, Margaret, 4,962,255, Cl. 585-467.000.
Lew, Hyok S. Exerciser for aerial maneuvers. 4,961,574, Cl. 272-109.000.
Lewis, Robert M. Lewis econosizer for hydraulically classifying particles. 4,961,843, Cl. 209-210.000.
Lewis, Thomas D.: *See—*
Risko, Frank D.; and Lewis, Thomas D., 4,961,490, Cl. 198-433.000.
Lhymn, Chang: *See—*
Lhymn, Yoon O.; and Lhymn, Chang, 4,962,003, Cl. 428-614.000.
Lhymn, Yoon O.; and Lhymn, Chang. Development of fusible alloy composites. 4,962,003, Cl. 428-614.000.
Li, Chien C.: *See—*
Cook, Kane D.; Li, Chien C.; Basu, Rajat S.; and Wilson, David P., 4,961,870, Cl. 252-171.000.
Liao, Kuan Y.; Chow, Yu C.; Chin, Maw-Rong; and Rhoades, Charles S. Fully recessed interconnection scheme with titanium-tungsten and selective CVD tungsten. 4,961,822, Cl. 156-656.000.
Liaw, H. Ming, to Motorola, Inc. Method of forming a defect-free semiconductor layer on insulator. 4,962,051, Cl. 437-26.000.
Lichtfuss, Gerhardt E.: *See—*
Nallenweg, Richard M.; and Lichtfuss, Gerhardt E., 4,961,652, Cl. 384-312.000.
Liebherr-Verzahntecknik GmbH: *See—*
Sulzer, Gerd, 4,961,289, Cl. 51-105.0GG.
Liebl, Josef, to MTU Motoren-Und Turbinen-Union Munchen GmbH. Apparatus for venting the rotor structure of a compressor of a gas turbine power plant. 4,961,309, Cl. 60-39.070.
Liedtke, Kurt: *See—*
Focke, Heinz; and Liedtke, Kurt, 4,961,496, Cl. 206-246.000.
Lierke, Ernst G.; Leung, Emily W.; and Bhat, Balakrishna T., to United States of America, National Aeronautics and Space Administration. Acoustic transducer apparatus with reduced thermal conduction. 4,962,330, Cl. 310-323.000.
Liles, Donald T., to Dow Corning Corporation. Precured silicone emulsion. 4,962,153, Cl. 524-837.000.
Liljebrand, Sven P.: *See—*
Larsson, Kenneth L.; and Liljebrand, Sven P., 4,961,469, Cl. 173-163.000.
Lim, Drahoslav; Jacoby, Stephen; Homick, Richard; and Powers, Frank, to American Cyanamid Company. Intraocular lens with colored legs and method of making. 4,961,746, Cl. 623-6.000.
Lim, Thomas F.: *See—*
Bujalski, Duane R.; LeGrow, Gary E.; and Lim, Thomas F., 4,962,175, Cl. 528-19.000.
Bujalski, Duane R.; DeGrow, Gary E.; and Lim, Thomas F., 4,962,176, Cl. 528-19.000.
Limb, Garth J.; and Limb, Sandra L. Insulating coverlet for conventional waterbeds. 4,961,238, Cl. 5-500.000.
Limb, Sandra L.: *See—*
Limb, Garth J.; and Limb, Sandra L., 4,961,238, Cl. 5-500.000.
Lin, Lifun; and Polan, Ned W., to Olin Corporation. Treatment of metal foil. 4,961,828, Cl. 204-27.000.
Lin, Long-Jin: *See—*
Bortnick, Newman M.; and Lin, Long-Jin, 4,962,165, Cl. 525-479.000.
Lin, Ming H. Ornamental crystal ball. 4,961,276, Cl. 40-410.000.
Lin, Tsai-Lain. Exercising apparatus. 4,961,571, Cl. 272-73.000.
Lindberg, Hans E., to Sandvik AB. Drill and cutting insert therefor. 4,961,672, Cl. 408-144.000.
Lindberg, Sven, to Aktiebolaget Bofors. Arrangement in an ammunition feeding path tanks. 4,961,367, Cl. 89-33.040.
Lindholm, Kari A.; and Bolsworth, James, to General Motors Corporation. Vehicle closure latch and pop-up device. 4,961,601, Cl. 292-216.000.
Liou, Fu-Tai; Miller, Robert O.; Farohani, Mohammed M.; and Han, Yu-Pin, to SGS-Thomson Microelectronics, Inc. Method for forming a contact/VIA. 4,962,414, Cl. 357-71.000.
Lippard, Stephen J.: *See—*
Villacorta, Gilberto M.; Ahn, Kwang-Hyun; and Lippard, Stephen J., 4,962,214, Cl. 556-33.000.
Lipscomb, G. Glenn, II: *See—*
Beck, Henry N.; Sanders, Edgar S., Jr.; and Lipscomb, G. Glenn, II, 4,962,131, Cl. 521-51.000.
Liquid Molding Systems, Inc.: *See—*
Brown, Paul E., 4,961,888, Cl. 264-40.600.
Lisec, Peter. Apparatus for determining the spacing between glass sheets of insulating glass panes. 4,961,270, Cl. 33-833.000.
Lisec, Peter. Apparatus for emplacing spacers. 4,961,816, Cl. 156-517.000.
Lisitsyn, Vitaly E.: *See—*
Shagun, Vladimir A.; Domrachev, Vladimir A.; Balykin, Pavel S.; Sokolov, Jury V.; Lisitsyn, Vitaly E.; and Petrakov, Vladimir P., 4,961,832, Cl. 204-298.070.
Listebarger, Earl R., Jr. Fishing leader holder. 4,961,281, Cl. 43-57.200.
Lister, Paul E.: *See—*
Wilson, Geoffrey; and Lister, Paul E., 4,961,336, Cl. 72-420.000.
Littelfuse, Inc.: *See—*
Sexton, William F., Jr., 4,962,363, Cl. 337-186.000.
Litton Systems, Inc.: *See—*
Belt, Roger F.; and Uhrin, Robert, 4,962,087, Cl. 505-1.000.
Rahn, John P.; and Hall, David, 4,962,506, Cl. 372-94.000.

Liu, Chain T.: *See*—
McKamey, Claudette G.; and Liu, Chain T., 4,961,903, Cl. 420-79.000.
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McCarty, Horace G.; and Hurlburt, Joseph C., to Ford New Holland, Inc. Apparatus for opening conditioning rolls. 4,961,303, Cl. 56-14.100.

McCaskill, Rex A.: *See*—
Hernandez, Irene H.; and McCaskill, Rex A., 4,962,475, Cl. 364-900.000.

McCloud, Debra S., to A Better World Company. Reusable diaper with detachable liner. 4,961,736, Cl. 604-385.100.

McCord, Thomas H.: *See*—
Perez, Jesus W.; Barrois, Melvin J.; McCord, Thomas H.; and O'Neil, Gregory R., 4,961,777, Cl. 75-313.000.

McCracken, Dennis C.; Malstrom, Charles R.; and Nielsen, Peter G., to AMP Incorporated. Dual molded sealed connector with internal gating. 4,961,713, Cl. 439-587.000.

McDavid, William T.; Bryce, William W.; and Itani, Talal A., to Terra Marine Engineering, Inc. Phase modulated system with phase domain filtering. 4,962,510, Cl. 375-67.000.

McDonald, Charles J.: *See*—
Pollock, Douglas K.; McDonald, Charles J.; Cohrs, William E.; and Reno, John M., 4,962,154, Cl. 525-54.100.

McDonald, Edward; Salmon, Roger; and Whittle, Alan J., to Imperial Chemical Industries PLC. Insecticidally and acaricidally active pyrimidine esters and intermediates therefor. 4,962,109, Cl. 514-256.000.

McDonald, Jay M.: *See*—
Fujita-Yamaguchi, Yoko; McDonald, Jay M.; and Sacks, David B., 4,962,155, Cl. 525-54.100.

McFarland, Michael J.: *See*—
Osuch, Christopher E.; and McFarland, Michael J., 4,962,171, Cl. 526-266.000.

McGhie, Joseph A.: *See*—
Boden, Richard M.; and McGhie, Joseph A., 4,962,089, Cl. 512-6.000.

McGill, Keith R., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Gun laying. 4,961,369, Cl. 89-41.110.

McKamey, Claudette G.; and Liu, Chain T., to Martin Marietta Energy Systems, Inc. Iron aluminide alloys with improved properties for high temperature applications. 4,961,903, Cl. 420-79.000.

McKenzie, Kenneth M.; Anderson, Wayne R.; and Abrams, Lorne, to Bonar Inc. Molded septic tank. 4,961,670, Cl. 405-53.000.

McKinley, Harry R.: *See*—
Fournier, Joseph T., Jr.; Smith, Stephen J.; McKinley, Harry R.; and McLean, William E., 4,961,626, Cl. 350-174.000.

McKinney, Osborne K.; Moore, Randy S.; and Wernli, James E., to Dow Chemical Company, The. Flame sprayable epoxy coating compositions. 4,962,137, Cl. 523-400.000.

McLaughlin, Patrick D., to Suncor, Inc. Primer centering device for large diameter blastholes. 4,961,381, Cl. 102-319.000.

McLaurin-Smith, Mark. Heat retaining fabric and physical therapy appliances. 4,961,418, Cl. 128-157.000.

McLean, William E.: *See*—
Fournier, Joseph T., Jr.; Smith, Stephen J.; McKinley, Harry R.; and McLean, William E., 4,961,626, Cl. 350-174.000.

McSherry, Charles K.: *See*—
Mosbach, Erwin H.; McSherry, Charles K.; Une, Mizuho; and Matoba, Naoyuki, 4,962,099, Cl. 514-177.000.

McVannel, Donald E.: *See*—
Huntress, Arnold R.; Landis, Daryl D.; McVannel, Donald E.; and Allen, Timothy, 4,962,221, Cl. 556-456.000.

McWhirter, John A., to Competition Cams, Inc. Rocker arm with a cost push rod seat. 4,961,407, Cl. 123-90.410.

McWilliams, John P.: *See*—
Le, Quang N.; Marler, David O.; McWilliams, John P.; Rubin, Mae K.; Shim, Joosup; and Wong, Stephen S., 4,962,256, Cl. 585-467.000.

Mead, Carver A.; Allen, Timothy P.; and Faggin, Federico, to Synaptics, Inc. Dynamic synapse for neural network. 4,962,342, Cl. 307-201.000.

Mead Corporation, The: *See*—
Colyer, E. Keith; O'Connor, Joseph G.; and Hammann, W. A., IV, 4,962,010, Cl. 430-138.000.
Moor, Marc L., 4,961,596, Cl. 281-15.100.

Meadows, Robert D., to Tektronix, Inc. Method and apparatus for calibrating an interleaved digitizer. 4,962,380, Cl. 341-120.000.

Mechtrix Corporation: *See*—
Butler, John D.; and Johnson, Keith A., 4,961,357, Cl. 81-9.510.

Medical Automation Specialities, Inc.: *See*—
Roginski, Edward T., 4,962,041, Cl. 436-150.000.

Medlin, William L.; and Manzi, Stephen J., to Mobil Oil Corporation. Acoustic borehole logging. 4,962,489, Cl. 367-32.000.

Medtronic, Inc.: *See*—
Canducci, Gian C., 4,961,423, Cl. 128-419.0PG.

Meguro, Hiroshi: *See*—
Otani, Tadashi; Meguro, Hiroshi; and Kosaka, Toru, 4,962,400, Cl. 354-195.100.

Melcher, Richard G.: *See*—
Morabito, Paul L.; Melcher, Richard G.; Hiller, Joseph F.; and McCabe, Terrence, 4,962,042, Cl. 436-161.000.

Mellem, Joachim: *See*—
Hirschmann, Clemens; Ungerer, Heinz-Jurgen; and Mellem, Joachim, 4,961,695, Cl. 425-72.200.

Mellon, Frank A., to Dow Corning Corporation. Silicone sealant compositions. 4,962,151, Cl. 524-788.000.

Melville, Judith B.: *See*—
Amelse, Jeffrey A.; Donohue, John A.; Kutz, Nancy A.; Melville, Judith B.; and Slusar, Brian L., 4,962,258, Cl. 585-480.000.

Menaert, Bertrand: *See*—
Marnier, Gerard; Boulanger, Benoit; Metezger, Marc; and Menaert, Bertrand, 4,961,819, Cl. 156-623.00R.

Mendelsohn, Gary H.: *See*—
Crossno, Patricia J.; Mendelsohn, Gary H.; and Hedberg, William F., 4,962,463, Cl. 364-518.000.

Menk, Gregory E.: *See*—
Geissberger, Arthur E.; Sadler, Robert A.; Menk, Gregory E.; and Balzan, Matthew L., 4,962,050, Cl. 437-22.000.

Menzel, Dietrich, to Menzel-Leuchten GmbH & Co. KG. Decorative column for housing requirements and similar purposes and a method of manufacturing such a column. 4,961,258, Cl. 52-747.000.

Menzel-Leuchten GmbH & Co. KG: *See*—
Menzel, Dietrich, 4,961,258, Cl. 52-747.000.

Menzinger, Wendelin: *See*—
Gollinger, Franz X.; and Menzinger, Wendelin, 4,961,379, Cl. 101-219.000.

Merchant, Abid N.: *See*—
Eggers, Michael E.; and Merchant, Abid N., 4,961,869, Cl. 252-170.000.

Merck & Co., Inc.: *See*—
DiNinno, Frank P.; and Salzmann, Thomas N., 4,962,101, Cl. 514-210.000.
Parsons, William H.; Schoen, William R.; and Patchett, ARthur A., 4,962,097, Cl. 514-114.000.

Merck Frosst Canada, Inc.: *See*—
Young, Robert N.; and Atkinson, Joseph G., 4,962,117, Cl. 514-365.000.

Merck Frost Canada, Inc.: *See*—
Young, Robert N.; Williams, Haydn W. R.; Leger, Serge; Frenette, Richard; and Zamboni, Robert, 4,962,203, Cl. 546-180.000.

Meredith, Steven E., to Sandvik Special Metals Corporation. Constant wall shaft with reinforced tip. 4,961,576, Cl. 273-80.00B.

Meserol, Peter M.; Bernstein, Philip; Prodell, Rita C.; and Gupta, Gargi, to Personal Diagnostics, Inc. Analyte determination using gel

including a reagent system reacts with analyte to change transmissive property of gel detectable by light beam transmitted through gel by total internal reflectance. 4,962,021, Cl. 435-7.000.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
Meyer, Meinhard; and Stormer, Oswald, 4,962,461, Cl. 364-482.000.
Poisel, Hans; Schreiber, Martina; and Trommer, Gerd, 4,962,311, Cl. 250-216.000.

Metal Industries, Inc.: *See—*
Leitzel, James A.; and Snyder, Wesley H., 4,961,247, Cl. 16-197.000.

Metallgesellschaft AG: *See—*
Wullenweber, Heinz; Kohl, Peter; Jung, Herbert; Borchardt, Jorges; Bickle, Wolfgang; Braus, Jurgen; and Hiedemann, Hans-Joachim, 4,961,901, Cl. 419-2.000.

Meteor AG: *See—*
Arnold, Ernst, 4,961,814, Cl. 156-446.000.

Metezger, Marc: *See—*
Marnier, Gerard; Boulanger, Benoit; Metezger, Marc; and Menaert, Bertrand, 4,961,819, Cl. 156-623.00R.

Metzler, Horst; and Schwarz, Gunther, to Schwabische Huttenwerke GmbH. Pig iron for the manufacture of brake bodies. 4,961,791, Cl. 148-2.000.

Metzner, Mathias: *See—*
Starz, Karl-Anton; Metzner, Mathias; and Weber, Wolfgang, 4,962,066, Cl. 501-19.000.

Meyer, Daniel F.: *See—*
Vincent, Gary A.; and Meyer, Daniel F., 4,961,961, Cl. 427-140.000.

Meyer, Meinhard; and Stormer, Oswald, to Messerschmitt-Bolkow-Blohm GmbH. Method for the reproducable formation of material layers and/or the treatment of semiconductor materials layers. 4,962,461, Cl. 364-482.000.

Meyers, Karl F.: *See—*
Schulz, Douglas K.; and Meyers, Karl F., 4,961,842, Cl. 209-155.000.

Michael, Daniel W., to Procter & Gamble Company, The. Powdered abrasive cleansers with encapsulated perfume. 4,961,871, Cl. 252-174.110.

Michael Horauf Maschinenfabrik GmbH & Co. KG: *See—*
Karolyi, Oskar, 4,961,565, Cl. 270-45.000.

Michalek, Thomas G.: *See—*
Joseph, Peter M.; Michalek, Thomas G.; and Gruber, Mylan, 4,961,733, Cl. 604-293.000.

Micheli, Adolph L.; Dungan, Dennis F.; Hamdi, Aboud H.; Mantese, Joseph V.; and Laugal, Ruth Carol O., to General Motors Corporation. Formation of film superconductors by metallo-organic deposition. 4,962,088, Cl. 505-1.000.

Micron Technology, Inc.: *See—*
Hulsey, David A., 4,961,232, Cl. 2-206.000.
Parkinson, Ward D.; and Chern, Wen-Foo, 4,962,326, Cl. 307-443.000.

Midkiff, John A.; Yancey, Cyril A.; and Pollock, Robert W., to Siecor Corporation. Preterminated optical cable. 4,961,623, Cl. 350-96.200.

Midmark Corporation: *See—*
Reeder, Ryan A.; Bester, David C.; and Oldiges, John H., 4,961,610, Cl. 297-412.000.

Migdal, Cyril A.; Hines, John B.; and Kluger, Edward W., to Milliken Research Corporation. Reactive, non-yellowing triazine compounds useful as UV screening agents for polymers. 4,962,142, Cl. 524-100.000.

Mihail, Stavros: *See—*
Berg, Marvin I.; Mihail, Stavros; and Oman, John E., 4,961,446, Cl. 141-144.000.

Mihara, Hirokata; Takagi, Koichi; Shimizu, Teruo; Tashiro, Katsunori; and Takahashi, Hideo, to Mitsubishi Jukogyo Kabushiki Kaisha. Can seamer. 4,961,300, Cl. 53-340.000.

Miike, Seiji: *See—*
Nogami, Hiroyasu; Miike, Seiji; Takeda, Ki.nihito; Amano, Shinya; and Aoyama, Chiaki, 4,962,452, Cl. 364-419.000.

Miki, Hisaya: *See—*
Yasuda, Masaaki; and Miki, Hisaya, 4,962,241, Cl. 568-737.000.

Mikita, Masaru: *See—*
Tanaka, Masashi; Yamauchi, Shigekazu; and Mikita, Masaru, 4,961,341, Cl. 73-118.100.

Miles Inc.: *See—*
Heidenreich, Holger; and Wehling, Klaus, 4,962,019, Cl. 435-4.000.

Miller, Gerald; and O'Connor, Christopher, to Analog Devices, Inc. Sample-hold amplifier circuit. 4,962,325, Cl. 307-353.000.

Miller, Robert O.: *See—*
Liou, Fu-Tai; Miller, Robert O.; Farohani, Mohammed M.; and Han, Yu-Pin, 4,962,414, Cl. 357-71.000.

Miller, William R.; and Klink, Jerome P., to Superior Glass Fibers, Inc. Mat pattern control system and method. 4,961,769, Cl. 65-4.400.

Milliken Research Corporation: *See—*
Migdal, Cyril A.; Hines, John B.; and Kluger, Edward W., 4,962,142, Cl. 524-100.000.

Mills, Fred M.: *See—*
Sherer, Douglas H.; and Mills, Fred M., 4,961,497, Cl. 206-315.400.

Milone, Philip G., to Wolverine Corporation. Treatment system. 4,961,373, Cl. 99-355.000.

Minamide, Toshiyuki: *See—*
Morishita, Masao; Kawatani, Hiroshi; and Minamide, Toshiyuki, 4,961,781, Cl. 75-244.000.

Minebea Co., Ltd.: *See—*
Fujita, Masahiko; Shishido, Yuuji; Suzuki, Yuzuru; and Okamoto, Masato, 4,962,329, Cl. 310-208.000.

Minestero Della Difesa Direzione Generale A.M.A.T.: *See—*
Cappa, Giulio; Moscatelli, Romano; and La Torre, Paolo, 4,961,420, Cl. 128-207.120.

Ministero dell'Universita e delle Ricerca Scientifica e Tecnologica: *See—*
Cannata, Vincenzo; Tamerlani, Giancarlo; and Morotti, Mauro, 4,962,223, Cl. 558-408.000.

Minnesota Mining and Manufacturing Company: *See—*
Dietz, Mark P., 4,961,965, Cl. 427-286.000.
Emslander, Jeffrey O.; Larson, Curtis L.; and Lepere, Pierre H., 4,962,000, Cl. 428-461.000.

Mino, Kouichi: *See—*
Kotani, Matahira; Matsumoto, Masafumi; Fujii, Mamoru; Hayashi, Motohiko; Hachinoda, Masayuki; Kondo, Mitsunobu; Murata, Naomitsu; and Mino, Kouichi, 4,962,526, Cl. 379-100.000.

Minolta Camera Kabushiki Kaisha: *See—*
Ishikawa, Norio; and Ishimura, Toshihiko, 4,962,397, Cl. 354-21.000.
Matuura, Kazuo; Sekino, Hitoshi; Nishiguchi, Keizo; and Yoshida, Narutaka, 4,962,312, Cl. 250-236.000.
Ueda, Masahide, 4,962,407, Cl. 355-208.000.
Yamamoto, Junichi; Tohyama, Yoshio; and Shiigi, Masahiro, 4,962,387, Cl. 346-76.0PH.

Miquelot, Gilles: *See—*
Duborper, Alain; Miquelot, Gilles; Rivier, Paul; and Rosset, Roger, 4,962,299, Cl. 219-492.000.

Mita Industrial Co. Ltd.: *See—*
Shibanaka, Mitsugu, 4,961,567, Cl. 271-293.000.
Wakikaido, Takahiro; and Sugiyama, Tsukasa, 4,962,404, Cl. 355-51.000.

Mita, Ryuichi; Katoh, Toshio; Higuchi, Chojiro; Oura, Takeshi; and Yamaguchi, Akihiro, to Mitsui Toatsu Chemicals, Incorporated. Preparation process of 60-l-aspartyl-l-phenylalanine methyl ester having low hygroscopicity. 4,962,222, Cl. 560-41.000.

Mitani, Kazutami: *See—*
Itoh, Hajime; Ohbori, Kouzi; Mitani, Kazutami; Takahashi, Hiroshi; Takehashi, Kouji; and Aoki, Kunihiro, 4,961,853, Cl. 210-500.340.

Mitsuba Electric Manufacturing Co., Ltd.: *See—*
Kurihara, Norimitsu; Asakura, Masahiko; Anzai, Hidehiko; and Matsui, Mitsuru, 4,961,475, Cl. 180-179.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Imai, Hitoshi; and Okada, Kazuo, 4,962,479, Cl. 365-119.000.
Isozumi, Shuzoo, 4,962,340, Cl. 290-48.000.
Kamibayasi, Isao, 4,961,561, Cl. 251-120.000.
Komatsu, Fumiaki; Sakamoto, Junichi; Fujimoto, Hitoshi; Ohtsuka, Hiroshi; Saigusa, Kazuyuki; Kabasawa, Akifumi; Yokodate, Shinya; and Kashiwagi, Kenichi, 4,962,521, Cl. 379-53.000.
Komurasaki, Satoshi, 4,961,338, Cl. 73-35.000.
Matsumoto, Osamu; Sumida, Mamoru; and Moriguchi, Teruhiko, 4,961,342, Cl. 73-118.100.
Matsumura, Masami; Hayashi, Masahiro; and Ueda, Atsushi, 4,961,410, Cl. 123-414.000.
Nakagawa, Shin-ichi; and Kawai, Hiroyuki, 4,962,343, Cl. 307-246.000.
Nishioka, Tadashi; Mashiko, Yoji; Morimoto, Hiroaki; and Koyama, Hiroshi, 4,962,059, Cl. 437-189.000.
Tada, Katsuhisa, 4,961,616, Cl. 350-96.200.
Takata, Yoshifumi, 4,962,061, Cl. 437-195.000.
Yasuda, Kenichi; Kobayashi, Toshifumi; and Yamada, Michihiro, 4,962,379, Cl. 340-825.510.

Mitsubishi Gas Chemical Company, Inc.: *See—*
Yabe, Seizo; and Yamazaki, Kunio, 4,961,894, Cl. 264-259.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Tanaka, Masashi; Yamauchi, Shigekazu; and Mikita, Masaru, 4,961,341, Cl. 73-118.100.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Kobayashi, Kazuyuki; and Hayashi, Shunichi, 4,961,409, Cl. 123-376.000.
Mihara, Hirokata; Takagi, Koichi; Shimizu, Teruo; Tashiro, Katsunori; and Takahashi, Hideo, 4,961,300, Cl. 53-340.000.

Mitsubishi Kasei Corporation: *See—*
Tateoka, Yasuo; Ito, Masashi; Maeda, Shuichi; Mitsuhashi, Kazuo; and Murayama, Tetsuo, 4,962,013, Cl. 430-338.000.

Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
Kojima, Tatsuo; Kobayashi, Tatsunori; Katou, Kouki; Ohba, Tetsuya; Yatsuzuka, Takashi; and Tanabe, Koji, 4,961,261, Cl. 29-895.210.

Mitsubishi Paper Mills Limited: *See—*
Matsumoto, Hisashi; Takami, Masaaki, deceased; Takahashi, Nobuyuki; and Inoue, Tetsuya, 4,962,079, Cl. 503-226.000.

Mitsubishi Rayon Co., Ltd.: *See—*
Itoh, Hajime; Ohbori, Kouzi; Mitani, Kazutami; Takahashi, Hiroshi; Takehashi, Kouji; and Aoki, Kunihiro, 4,961,853, Cl. 210-500.340.

Mitsuhashi, Hiroshi: *See—*
Matsuoka, Yoshiyuki; Hosaka, Kunio; Takeda, Shigefumi; and Mitsuhashi, Hiroshi, 4,962,211, Cl. 549-436.000.

Mitsuhashi, Kazuo: *See—*
Tateoka, Yasuo; Ito, Masashi; Maeda, Shuichi; Mitsuhashi, Kazuo; and Murayama, Tetsuo, 4,962,013, Cl. 430-338.000.

Mitsui Petrochemical Industries, Ltd.: *See*—
Kihara, Noriaki; Tomino, Ikuo; Tan, Hiroaki; and Ishihara, Takafumi, 4,962,200, Cl. 544-333.000.
Yasuda, Masaaki; and Miki, Hisaya, 4,962,241, Cl. 568-737.000.

Mitsui Toatsu Chemicals, Incorporated: *See*—
Mita, Ryuichi; Katoh, Toshio; Higuchi, Chojiro; Oura, Takeshi; and Yamaguchi, Akihiro, 4,962,222, Cl. 560-41.000.

Mitsuishi, Naoki: *See*—
Takeshima, Masahiko; and Mitsuishi, Naoki, 4,962,484, Cl. 365-226.000.

Miura, Hirohiko: *See*—
Yamagishi, Fujio; and Miura, Hirohiko, 4,961,361, Cl. 84-201.000.

Miyake, Akio; Kondo, Masahiro; and Fujino, Masahiko, to Takeda Chemical Industries, Ltd. 3-Condensed imidazolium-cephem compounds. 4,962,100, Cl. 514-202.000.

Miyake, Tetsuya: *See*—
Simoyama, Yoshirou; Nakajima, Toyohei; Tanaka, Nobuyuki; and Miyake, Tetsuya, 4,961,690, Cl. 417-222.000.

Miyamaru, Yukio: *See*—
Hatanaka, Kaoru; Miyamaru, Yukio; and Kawada, Shigeo, 4,962,366, Cl. 340-56.000.

Miyamoto, Satoshi; and Nagatani, Masamichi, to Henkel Corporation. Phosphate coatings for metal surfaces. 4,961,794, Cl. 148-262.000.

Miyashita, Osamu: *See*—
Fukui, Yasuhiro; and Miyashita, Osamu, 4,961,692, Cl. 417-241.000.

Miyawaki, Mamoru: *See*—
Shinohara, Mahito; Sugawa, Shigetoshi; Hashimoto, Seiji; and Miyawaki, Mamoru, 4,962,412, Cl. 357-30.000.

Miyazawa, Hiroyuki: *See*—
Asayama, Kyoichiro; Miyazawa, Hiroyuki; Kobayashi, Yutaka; and Yukutake, Seigou, 4,962,052, Cl. 437-31.000.

Miyazawa, Kazutoshi: *See*—
Ohno, Kouji; Inoue, Hiromichi; Saito, Shinichi; Miyazawa, Kazutoshi; and Ushioda, Makoto, 4,961,875, Cl. 252-299.660.

Mizuno, Kotaro; and Asahi, Yasuhiko, to Yamaha Corporation. Control unit for electronic musical instrument. 4,961,363, Cl. 84-615.000.

Mizuno, Toshiya: *See*—
Satake, Yoshikatsu; Yamamoto, Shinji; Kaneko, Takashi; Tada, Masahito; Kashiwadate, Ken; Mizuno, Toshiya; Endo, Hiroyuki; Katto, Takayuki; and Shiiki, Zenya, 4,962,143, Cl. 524-100.000.

Mobil Oil Corp.: *See*—
Absil, Robert P. L.; Han, Scott; Marler, David O.; and Shihabi, David S., 4,962,257, Cl. 585-475.000.
Balloni, Ricardo; and Nahmias, A. Michael, 4,961,992, Cl. 428-332.000.
Bell, Weldon K.; Haag, Werner O.; and Marler, David O., 4,962,239, Cl. 568-697.000.
Chen, Catherine S. H.; and Wu, Margaret M. S., 4,962,249, Cl. 585-329.000.
Chen, Nai Y.; and Degnan, Thomas F., 4,962,074, Cl. 502-67.000.
Doner, John P.; Horodysky, Andrew G.; and Keller, John A., Jr., 4,961,868, Cl. 252-32.70E.
Green, Gary J.; and Shihabi, David S., 4,962,075, Cl. 502-71.000.
Hellring, Stuart D., 4,962,228, Cl. 562-8.000.
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,961,907, Cl. 422-144.000.
LaPierre, Rene B.; Partridge, Randall D.; and Wong, Stephen S., 4,962,269, Cl. 585-739.000.
Le, Quang N.; Marler, David O.; McWilliams, John P.; Rubin, Mae K.; Shim, Joosup; and Wong, Stephen S., 4,962,256, Cl. 585-467.000.
Lyle, W. D.; and Williams, D. Michael, 4,962,490, Cl. 367-35.000.
Medlin, William L.; and Manzi, Stephen J., 4,962,489, Cl. 367-32.000.
Pebdani, Farrokh N., 4,961,467, Cl. 166-261.000.
Provan, Alexander R.; and Vanderlee, David G., 4,961,684, Cl. 414-786.000.
Yan, Tsoung Y., 4,962,276, Cl. 585-867.000.

Mobile Oil Corp.: *See*—
Dessau, Ralph M.; and Partridge, Randall D., 4,962,250, Cl. 585-417.000.

Mochizuki, Takayasu; Unternahrer, Josef R.; and Moriyama, Mitsuhisa, to Hoya Corporation; and Research Development Corporation. Solid-state laser device having a high conversion efficiency between electric power and output power and a lamp device therefor. 4,962,505, Cl. 372-72.000.

Moeller, David E., to Loomis Plastics Incorporated. Rod holder. 4,961,505, Cl. 211-70.800.

Moerdyke, Donald D.: *See*—
Harbolt, Bruce A.; and Moerdyke, Donald D., 4,962,283, Cl. 564-63.000.

Moffitt, Bryan S.: *See*—
Ferenc, James J.; Goke, Louis R.; Grimes, Gary J.; and Moffitt, Bryan S., 4,962,497, Cl. 370-60.100.

Mohr, Kristina: *See*—
Demus, Dietrich; Zaschke, Horst; Weissflog, Wolfgang; Mohr, Kristina; Kohler, Saskia; and Worm, Kerstin, 4,961,876, Cl. 252-299.670.

Moldowan, Mervin J. Reagent alcohol test strip device. 4,962,025, Cl. 435-25.000.

Moll, Maurice M.: *See*—
Crafts, Harold S.; and Moll, Maurice M., 4,962,345, Cl. 307-270.000.

Molnar, William S., to W. S. Molnar Co. Articles with slip resistant surfaces and method of making same. 4,961,973, Cl. 427-423.000.

Monhart, Vaclay: *See*—
Cermak, Pavel; Monhart, Vaclay; Horak, Jire,acu/i ; Tlustakova, Marie; and Paroubek, Miroslav, 4,962,036, Cl. 435-34.000.

Monsanto Company: *See*—
Smith, Lowell R., 4,962,212, Cl. 549-491.000.
Yalamanchili, Gopi, 4,962,199, Cl. 544-239.000.

Moor, Marc L., to Mead Corporation, The. Binder pouch. 4,961,596, Cl. 281-15.100.

Moore, James H.; Retzlaff, Klaus M.; and Robbins, Kenneth E., to General Electric Company. Single shaft combined cycle turbine. 4,961,310, Cl. 60-39.182.

Moore, John: *See*—
Gossedge, Graham M.; Maskell, Alan J.; and Moore, John, 4,961,513, Cl. 220-276.000.

Moore, R. Gilbert, to Thiokol Corporation. Apparatus for foaming bubbles. 4,961,699, Cl. 425-387.100.

Moore, Randy S.: *See*—
McKinney, Osborne K.; Moore, Randy S.; and Wernli, James E., 4,962,137, Cl. 523-400.000.

Moore, Robert; and Lamb, Steven, to Orthopedic Systems, Inc. Knee brace. 4,961,416, Cl. 128-80.00C.

Moorehead, Robert M.: *See*—
Eppler, Susan G.; and Moorehead, Robert M., 4,962,538, Cl. 382-1.000.

Morabito, Paul L.; Meicher, Richard G.; Hiller, Joseph F.; and McCabe, Terrence, to Dow Chemical Company, The. Method for on-column injection gas chromatography. 4,962,042, Cl. 436-161.000.

Moran, Christopher J.: *See*—
Marchosky, J. Alexander; Moran, Christopher J.; and Fearnot, Neal E., 4,961,422, Cl. 128-401.000.

Morehouse, David F. Curtain rod hanger. 4,961,296, Cl. 52-37.000.

Morelli, Marco: *See*—
Maggioni, Giampietro; Marchio, Fabio; Morelli, Marco; and Tricoli, Francesco, 4,962,346, Cl. 307-270.000.

Morgan, Ian H.; and McAvoy, Sean, to Cooper Industries, Inc. Clamp assemblies. 4,961,444, Cl. 137-315.000.

Morgan, Thomas A., to Phillips Petroleum Company. Load sharing for parallel flares. 4,961,703, Cl. 431-5.000.

Mori, Hajime: *See*—
Kawai, Shuji; Oshino, Kazushi; Okoshi, Hiromi; Mori, Hajime; Ozaki, Katsuya; Shikata, Shitsuw; Ito, Susumu; and Okamoto, Kikuhiko, 4,962,030, Cl. 435-209.000.

Mori, Yoshihisa: *See*—
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Moriguchi, Teruhiko: *See*—
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Morimoto, Hiroaki: *See*—
Nishioka, Tadashi; Mashiko, Yoji; Morimoto, Hiroaki; and Koyama, Hiroshi, 4,962,059, Cl. 437-189.000.

Morimoto, Junji: *See*—
Masuda, Jitsuo; Morimoto, Junji; Yamagishi, Ken; Kinashi, Hiroshi; Kawabata, Itaru; and Noguchi, Teruhiko, 4,962,408, Cl. 355-245.000.

Morimoto, Mituaki, to Sharp Kabushiki Kaisha. Method and apparatus for dispersing spacers of a liquid-crystal display panel. 4,961,962, Cl. 427-180.000.

Morishita, Hirohisa; Masamoto, Junzo; and Hata, Tadashige, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing high purity formaldehyde. 4,962,235, Cl. 568-493.000.

Morishita, Ken: *See*—
Shimizu, Hirofumi; and Morishita, Ken, 4,961,877, Cl. 252-358.000.

Morishita, Masao; Kawatani, Hiroshi; and Minamide, Toshiyuki, to Kabushiki Kaisha Kobe Seiko Sho. High corrosion-and wear resistant-powder sintered alloy and composite products. 4,961,781, Cl. 75-244.000.

Morita, Hiroshi: *See*—
Yoshida, Naoyuki; Kaneoya, Masakazu; Uchida, Manabu; and Morita, Hiroshi, 4,962,031, Cl. 435-280.000.

Morita, Masahiro: *See*—
Matoba, Takeji; and Morita, Masahiro, 4,961,944, Cl. 426-107.000.

Moriyama, Mitsuhisa: *See*—
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Morizumi, Masaaki: *See*—
Kondo, Shigeru; Takatori, Naoki; Morizumi, Masaaki; and Kanamori, Shino, 4,961,635, Cl. 350-429.000.

Morotti, Mauro: *See*—
Cannata, Vincenzo; Tamerlani, Giancarlo; and Morotti, Mauro, 4,962,223, Cl. 558-408.000.

Morozumi, Hideki: *See*—
Kitahara, Tsuyoshi; Yonekubo, Shuji; Morozumi, Hideki; Higashimura, Koichi; and Matsuzawa, Masanao, 4,962,391, Cl. 346-140.00R.

Mortensen, Andreas: *See*—
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Morton Thiokol, Inc.: *See*—
Candore, Amedeo, 4,961,808, Cl. 156-264.000.

Mosbach, Erwin H.; McSherry, Charles K.; Une, Mizuho; and Matoba, Naoyuki, to Beth Israel Medical Center. Chemical synthesis. 4,962,099, Cl. 514-177.000.

Moscatelli, Romano: *See*—
Cappa, Giulio; Moscatelli, Romano; and La Torre, Paolo, 4,961,420, Cl. 128-207.120.

Mostwin, Jacek L.: *See—*
Wascher, Uwe; Mostwin, Jacek L.; Belden, Lorne, Jr.; and Kushner, Gerald, 4,961,747, Cl. 623-12.000.

Mota, Carlos: *See—*
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Motorola, Inc.: *See—*
Bai, Monty W.; Farace, Louis P.; and Titus, John D., 4,961,382, Cl. 102-476.000.
Edwards, Arthur J., 4,962,348, Cl. 322-58.000.
Klaczak, Lynne D.; and Stair, Mark T., 4,962,545, Cl. 455-200.000.
Liaw, H. Ming, 4,962,051, Cl. 437-26.000.
Lunn, Gerald K.; and Tong, Hing Y., 4,962,427, Cl. 358-188.000.
Tong, Hing Y.; and Lunn, Gerald K., 4,962,428, Cl. 358-188.000.
Wallace, Craig S.; and Breeden, Robert L., 4,962,377, Cl. 340-825.440.

Mottate, Tatsuo, to Nippon Thompson Co., Ltd. Finite linear motion rolling guide unit. 4,961,649, Cl. 384-49.000.

Mountain Marine, Inc.: *See—*
Anderson, Robert C., Jr.; and Perry, Robert O., Jr., 4,961,398, Cl. 114-368.000.

Moy, Paul Y. Y.; Parr, William J. E.; Frank, Dieter; and Hutton, Ronald E., to Akzo America Inc. Conductive metal-filled substrates via developing agents. 4,961,879, Cl. 252-512.000.

Moyzis, Robert K.: *See—*
Jett, James H.; Keller, Richard A.; Martin, John C.; Moyzis, Robert K.; Ratliff, Robert L.; Shera, E. Brooks; and Stewart, Carleton C., 4,962,037, Cl. 435-6.000.

MTU Friedrischshafen: *See—*
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MTU-Motoren-und Turbinen-Union Muenchen GmbH: *See—*
Neubert, Horst, 4,961,685, Cl. 415-197.000.

MTU Motoren-Und Turbinen-Union Munchen GmbH: *See—*
Liebl, Josef, 4,961,309, Cl. 60-39.070.

Mudge, Paul R., to National Starch and Chemical Investment Holding Corporation. Ethylene vinyl acetate-dioctyl maleate-2-ethylhexyl acrylate interpolymers. 4,961,993, Cl. 428-343.000.

Mueller, James H.: *See—*
Pennington, Rodney L.; and Mueller, James H., 4,961,908, Cl. 422-173.000.

Muller, George H., to Berke, Joseph J.; and Muller, George H., part interest to each. Locking device. 4,961,421, Cl. 606-180.000.

Muller, Klaus: *See—*
Wirth, Hermann O.; and Muller, Klaus, 4,962,227, Cl. 562-8.000.

Mullins, Michael A., to Drew Chemical Corporation. Corrosion inhibitor for a closed aqueous cooling system. 4,961,878, Cl. 252-389.300.

Mundhenke, Erich. Lock bit arresting cylinder lock. 4,961,328, Cl. 70-1.500.

Munro, William H.: *See—*
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Murai, Kazuo, to Ricoh Company, Ltd. Color image generating apparatus. 4,962,421, Cl. 358-76.000.

Murakawa, Takashi: *See—*
Yamamoto, Takashi; Yoneda, Toshikazu; Katsuno, Hisashi; Murakawa, Takashi; and Takahashi, Nobuyuki, 4,962,251, Cl. 585-419.000.

Murata Manufacturing Co., Ltd.: *See—*
Kobayashi, Shouzo; Takagi, Hiroshi; and Sakabe, Yukio, 4,961,835, Cl. 204-427.000.

Murata, Naomitsu: *See—*
Kotani, Matahira; Matsumoto, Masafumi; Fujii, Mamoru; Hayashi, Motohiko; Hachinoda, Masayuki; Kondo, Mitsunobu; Murata, Naomitsu; and Mino, Kouichi, 4,962,526, Cl. 379-100.000.

Murata, Yoshitoshi; Ohta, Yuji; Yotsutani, Akio; Hara, Toshihiro; Ono, Koji; and Fuse, Shoji, to Nippon Telegraph and Telephone Corporation; NEC Corporation; and Kabushiki Kaisha Toshiba. Cordless telephone apparatus and a method of controlling same. 4,962,524, Cl. 379-61.000.

Murayama, Tetsuo: *See—*
Tateoka, Yasuo; Ito, Masashi; Maeda, Shuichi; Mitsuhashi, Kazuo; and Murayama, Tetsuo, 4,962,013, Cl. 430-338.000.

Murotani, Isao: *See—*
Yanagida, Takeshi; and Murotani, Isao, 4,962,130, Cl. 514-846.000.

Murphy, Gerald J.: *See—*
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Murphy, James F.: *See—*
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Murphy, Timothy O.: *See—*
Hernandez-Gil, Jose F.; Korotky, Steven K.; Murphy, Timothy O.; and Veselka, John J., 4,961,619, Cl. 350-96.120.

Murphy, William J., to Exxon Research and Engineering Company. Synthesis of transition metal alumino-silicate IOZ-5 and use of it for hydrocarbon conversion. 4,961,836, Cl. 208-111.000.

Murray, Donald W.: *See—*
Cawthron, Derrick; Woods, Robert L.; Story, James B.; Lammons, Carl S.; and Murray, Donald W., 4,961,605, Cl. 293-128.000.

Murray, Myles N. Anti-projectile protection fence and method for marine surface vessels. 4,961,393, Cl. 114-240.00R.

Myers, John D., to Kigre, Inc. Erbium laser glass compositions. 4,962,067, Cl. 501-45.000.

Naaktgeboren, Adrianus: *See—*
Van Eecke, Roger H.; Naaktgeboren, Adrianus; and Van Den Bossche, Bart, 4,961,679, Cl. 414-111.000.

Nabisco Brands, Inc.: *See—*
Antrim, Richard L.; and Taylor, James B., 4,961,939, Cl. 426-61.000.
Blanthorn, Michele; and Labaw, Glen, 4,961,943, Cl. 426-102.000.
Cocco, Mark V.; Ross, Robert E.; and Thulin, Robert R., 4,961,941, Cl. 426-94.000.
Cocco, Mark V.; Ross, Robert E.; and Thulin, Robert R., 4,961,942, Cl. 426-94.000.

Nagase, Moriharu; Shibuya, Mutsumi; Asami, Kuniaki; Matsumoto, Katsuo; Teranishi, Hikaru; and Saito, Sukeo, to Showa Yakuhin Kako Co., Ltd; and Nitto Electric Industrial Co., Ltd. Simplified detection implement. 4,962,043, Cl. 436-165.000.

Nagata, Yasuhisa: *See—*
Kosuda, Hiroyuki; Nagata, Yasuhisa; and Andoh, Masato, 4,962,162, Cl. 525-422.000.

Nagatani, Masamichi: *See—*
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Nahmias, A. Michael: *See—*
Balloni, Ricardo; and Nahmias, A. Michael, 4,961,992, Cl. 428-332.000.

Nakagawa, Katsuhiko, to NEC Corporation. Data processor including testing structure for a barrel shifter. 4,962,500, Cl. 371-24.000.

Nakagawa, Shin-ichi; and Kawai, Hiroyuki, to Mitsubishi Denki Kabushiki Kaisha. Signal transmission circuit. 4,962,343, Cl. 307-246.000.

Nakagawa, Wataru: *See—*
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Nakajima, Isao: *See—*
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Nakajima, Toyohei: *See—*
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Nakamura, Iakuya: *See—*
Takahashi, Hironori; Aoshima, Shinichiro; Nakamura, Iakuya; and Tsuchiya, Yutaka, 4,962,353, Cl. 324-96.000.

Nakamura, Joji; Kubo, Kazuhiro; Ichikawa, Shunji; Takahashi, Hajime; Isozumi, Keisuke; and Yamada, Toyofumi, to Kyowa Hakko Kogyo Kabushiki Kaisha; and Ihara Chemical Kogyo Kabushiki Kaisha. Agent for cerebral protection. 4,962,107, Cl. 514-237.500.

Nakamura, Koki, to Fuji Photo Film Co., Ltd. Silver halide photographic materials. 4,962,017, Cl. 430-551.000.

Nakamura, Nanao: *See—*
Sakai, Tadashi; Uno, Shigeki; Koyama, Masao; and Nakamura, Nanao, 4,961,833, Cl. 204-403.000.

Nakamura, Takashi, to Fuji Photo Film Co., Ltd. Processing solution container. 4,961,516, Cl. 222-94.000.

Nakamura, Takeaki: *See—*
Kubota, Tatsuya; Gotanda, Masakazu; Hatta, Shinji; Karasawa, Hitoshi; Kubota, Tetsumaru; Nakamura, Takeaki; Takayama, Syuichi; and Sasaki, Hiroshi, 4,961,424, Cl. 128-24.00A.

Nakamura, Takuji: *See—*
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Nakasuji, Yoshizumi: *See—*
Yoshida, Akihiko; and Nakasuji, Yoshizumi, 4,962,002, Cl. 428-609.000.

Nakaya, Masahide, to Ricoh Company, Ltd. Corona discharging device. 4,962,307, Cl. 250-324.000.

Nallenweg, Richard M.; and Lichtfuss, Gerhardt E., to Sundstrand Corporation. Radial bearing. 4,961,652, Cl. 384-312.000.

Namekawa, Kouroku, deceased (Namekawa, Tsuneko, heiress); and Namekawa, Naoki, heir, to Aloka Co., Ltd. Ultrasonic doppler diagnostic apparatus. 4,961,427, Cl. 128-661.090.

Namekawa, Naoki, heir: *See—*
Namekawa, Kouroku, deceased; and Namekawa, Naoki, heir, 4,961,427, Cl. 128-661.090.

Namekawa, Tsuneko, heiress: *See—*
Namekawa, Kouroku, deceased; and Namekawa, Naoki, heir, 4,961,427, Cl. 128-661.090.

Namikawa, Osamu: *See—*
Nemoto, Shigeo; Namikawa, Osamu; Tsuchiya, Kiyomi; Nakajima, Isao; Kikuchi, Yasuo; Sugaya, Tomio; Ogawa, Toshitaka; and Katagiri, Sigenobu, 4,961,704, Cl. 432-8.000.

Nanyoshi, Yasutoshi: *See—*
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Naoi, Nobuaki; Takeda, Katunobu; and Yuki, Ikuo, to Hitachi, Ltd. Dynamic noise reduction circuit for image luminance signal. 4,962,426, Cl. 358-167.000.

Naoumidis, Aristides: *See—*
Gottselig, Bernd; Gyarmati, Erno ; and Naoumidis, Aristides, 4,961,529, Cl. 228-124.000.

Nash, Douglas H., to Austin Rover Group Limited. Sun visor incorporating a slidable mirror. 4,961,608, Cl. 296-97.500.

National Research Council of Canada/Conseil National deRestherches Canada: *See—*
Rea, Mark S., 4,962,425, Cl. 358-139.000.
National Research Development Corporation: *See—*
Martin, William J., 4,961,915, Cl. 422-116.000.
National Reserach Development Corporation: *See—*
Majumdar, Amalendu J.; and Singh, Bahadur, 4,961,787, Cl. 106-692.000.
National Semiconductor Corporation: *See—*
Ta, Paul D., 4,962,323, Cl. 307-350.000.
National Starch and Chemical Investment Holding Corporation: *See—*
Mudge, Paul R., 4,961,993, Cl. 428-343.000.
Senkalski, Robert E.; and Hasenmayer, Donald L., 4,961,998, Cl. 428-426.000.
Nautico Gesellschaft fur Planung und Vertrieb von Rettungs- und-Badeinseln m.b.H.: *See—*
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NCR Corporation: *See—*
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Fadem, Richard J., 4,962,378, Cl. 340-825.500.
Jingu, Toshihiro; and Kusayanagi, Masao, 4,961,657, Cl. 400-599.000.
NEC Corporation: *See—*
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Jinbo, Toshikatsu, 4,962,482, Cl. 365-189.110.
Kawada, Koji, 4,962,476, Cl. 365-53.000.
Masuda, Hajime, 4,962,478, Cl. 365-96.000.
Murata, Yoshitoshi; Ohta, Yuji; Yotsutani, Akio; Hara, Toshihiro; Ono, Koji; and Fuse, Shoji, 4,962,524, Cl. 379-61.000.
Nakagawa, Katsuhiko, 4,962,500, Cl. 371-24.000.
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Needham, Gregory A.: *See—*
Swain, David M.; Needham, Gregory A.; and Fontana, Louis R., 4,961,627, Cl. 350-319.000.
Nel, Barend J. M. Irrigation method and apparatus. 4,961,531, Cl. 239-1.000.
Nelson, Gerald J.; Stommes, Wally; and Rose, John, to Stonel Corporation. Shaft position indicating and display means with adjustable mounting adapter. 4,962,290, Cl. 200-308.000.
Nemoto, Shigeo; Namikawa, Osamu; Tsuchiya, Kiyomi; Nakajima, Isao; Kikuchi, Yasuo; Sugaya, Tomio; Ogawa, Toshitaka; and Katagiri, Sigenobu, to Hitachi Koki Company, Ltd. Sheet meandering movement preventing method. 4,961,704, Cl. 432-8.000.
Neogi, Amar H.: *See—*
Perdelwitz, Jr., Lee E.; Young, Robert H.; Hasenwinkle, Earl D.; Iff, Ron H.; and Neogi, Amar H., 4,961,930, Cl. 424-411.000.
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Hansson, Nils E., 4,961,940, Cl. 426-89.000.
Nestle S.A.: *See—*
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Neu, Max G.: *See—*
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Neubert, Horst, to MTU-Motoren-und Turbinen-Union Muenchen GmbH. Protection ring of fiber material for containing fragments of bursting structural components. 4,961,685, Cl. 415-197.000.
Neumann, Peter: *See—*
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New Central Corporation: *See—*
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Neynaber Chemie GmbH: *See—*
Worschech, Kurt; Fleischer, Erwin; Wedl, Peter; Loeffelholz, Frido; and Brand, Ernst-Udo, 4,962,145, Cl. 524-310.000.
NGK Insulators, Ltd.: *See—*
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NGK Spark Plug Co., Ltd.: *See—*
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Nguyen, Khoa D.: *See—*
Beauregard, Gary M.; Loucks, Larry K.; Nguyen, Khoa D.; and Urquhart, Robert J., 4,962,468, Cl. 364-521.000.
Nguyen, Tuyen T.: *See—*
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Nielsen, Peter G.: *See—*
McCracken, Dennis C.; Malstrom, Charles R.; and Nielsen, Peter G., 4,961,713, Cl. 439-587.000.
Niemerg, Willi: *See—*
Bruning, Paul; Mackel, Wilfried; Wrede, Ulrich; and Niemerg, Willi, 4,961,723, Cl. 494-56.000.
Niggemann, Richard E., to Sunstrand Corporation. Cold chassis for cooling electronic circuit components on an electronic board. 4,962,444, Cl. 361-382.000.
Nijhuis Water B. V.: *See—*
Ottengraf, Simon P. P.; and Wijers, Johannes G., 4,961,857, Cl. 210-703.000.
Nikias, Chrysostomos L.; Brooks, Dana H.; Siegel, John H.; and Fabian, Miklos, to Northeastern University; and University of Maryland. Non-invasive method and apparatus for describing the electrical activity of the surface of an interior organ. 4,961,428, Cl. 128-699.000.
Nikon Corporation: *See—*
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Nilsson, Hans E. G. Device for adaption of a suction pad to the outer shape of products to be lifted. 4,961,606, Cl. 294-65.000.
Nilsson, Hans E. G. Device for preventing damage to shock susceptible products. 4,961,682, Cl. 414-620.000.
Nippon Chemiphar Co., Ltd.: *See—*
Masaki, Mitsuo; Takeda, Hiromitsu; Kamishiro, Toshiro; and Yamamoto, Masao, 4,962,096, Cl. 514-92.000.
Nippon Kayaku Kabushiki Kaisha: *See—*
Takatsuto, Suguru; Sato, Hitoshi; and Futatsuya, Fumio, 4,961,775, Cl. 71-88.000.
Nippon Oil Company, Limited: *See—*
Shiraishi, Takeichi; Uchida, Wataru; and Matsuura, Kazuo, 4,962,167, Cl. 526-125.000.
Nippon Oil & Fats Co., Ltd.: *See—*
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Nippon Paint Co., Ltd.: *See—*
Iimure, Tamio, 4,961,960, Cl. 427-54.100.
Nippon Petrochemicals Co., Ltd: *See—*
Orikasa, Yuichi; Sakazume, Suehiro; Nishimura, Sadahiro; and Maki, Yoshinori, 4,962,148, Cl. 524-504.000.
Nippon Shokubai Kagaku Kogyo, Co., Ltd.: *See—*
Kita, Yuichi; Kishino, Kazuo; and Fukui, Akio, 4,962,205, Cl. 548-549.000.
Nippon Steel Corporation: *See—*
Homma, Koji; Kihira, Hiroshi; Ito, Satoshi; Matsuoka, Kazumi; and Hirosawa, Noriyuki, 4,962,360, Cl. 324-700.000.
Kishida, Koji; and Akisue, Osamu, 4,961,793, Cl. 148-12.00C.
Kojima, Tatsuo; Kobayashi, Tatsunori; Katou, Kouki; Ohba, Tetsuya; Yatsuzuka, Takashi; and Tanabe, Koji, 4,961,261, Cl. 29-895.210.
Nippon Telegraph: *See—*
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Nippon Telegraph and Telephone Corporation: *See—*
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Nippon Thompson Co., Ltd.: *See—*
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Suzuki, Osamu; and Masuda, Ichiro, 4,961,653, Cl. 384-447.000.
Nippondenso Co., Ltd.: *See—*
Katsuna, Kiyoharu; Ogura, Kenji; and Hirata, Toshio, 4,961,323, Cl. 62-244.000.
Tokura, Norihito; Kuno, Hironari; Ito, Hiroyasu; Saito, Hirohiko; and Hara, Kunihiko, 4,962,411, Cl. 357-23.400.
Nishi, Kenji, to Nikon Corporation. Alignment system for exposure apparatus. 4,962,318, Cl. 250-548.000.
Nishi, Toshiyuki: *See—*
Sato, Makoto; Takemura, Makoto; Higashi, Kunio; Soga, Tsunehiko; Matsumoto, Hiroo; and Nishi, Toshiyuki, 4,962,202, Cl. 546-112.000.
Nishiguchi, Keizo: *See—*
Matuura, Kazuo; Sekino, Hitoshi; Nishiguchi, Keizo; and Yoshida, Narutaka, 4,962,312, Cl. 250-236.000.
Nishikawa, Kohei: *See—*
Tsushima, Susumu; Takatani, Muneo; and Nishikawa, Kohei, 4,962,113, Cl. 514-307.000.
Nishikawa, Reiji: *See—*
Iida, Atsuko; Obdaira, Hirosi; Katsura, Masaki; Nishikawa, Reiji; and Ozawa, Norio, 4,961,979, Cl. 428-64.000.
Nishikawa, Shizuo: *See—*
Asakura, Tadao; and Nishikawa, Shizuo, 4,962,446, Cl. 361-400.000.
Nishikawa, Yoshihiro: *See—*
Ohkawa, Masanori; and Nishikawa, Yoshihiro, 4,962,093, Cl. 514-53.000.
Nishimura, Sadahiro: *See—*
Orikasa, Yuichi; Sakazume, Suehiro; Nishimura, Sadahiro; and Maki, Yoshinori, 4,962,148, Cl. 524-504.000.
Nishioka, Tadashi; Mashiko, Yoji; Morimoto, Hiroaki; and Koyama, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Process for forming electrodes for semiconductor devices using focused ion beam deposition. 4,962,059, Cl. 437-189.000.
Nissan Motor Company, Limited: *See—*
Fukushima, Naoto; Fukunaga, Yukio; Akatsu, Yohsuke; Fujimura, Itaru; and Satoh, Masaharu, 4,961,595, Cl. 280-772.000.
Ishikawa, Yasuki; Yasuno, Yoshiki; Higashimata, Akira; and Fujishiro, Takeshi, 4,962,455, Cl. 364-426.020.
Oshiage, Katsunori; and Nanyoshi, Yasutoshi, 4,961,411, Cl. 123-492.000.
Uchiyama, Makoto; and Nojiri, Hidetoshi, 4,962,062, Cl. 437-225.000.
Nissan Motor Co., Ltd. Yokohama: *See—*
Tateoka, Yasuo; Ito, Masashi; Maeda, Shuichi; Mitsuhashi, Kazuo; and Murayama, Tetsuo, 4,962,013, Cl. 430-338.000.
Nisshinbo Industries, Inc.: *See—*
Kaihatsu, Noboru, 4,961,493, Cl. 206-0.500.

Nitto Electric Industrial Co., Ltd.: *See*—
Nagase, Moriharu; Shibuya, Mutsumi; Asami, Kuniaki; Matsumoto, Katsuo; Teranishi, Hikaru; and Saito, Sukeo, 4,962,043, Cl. 436-165.000.

NKK Corporation: *See*—
Tanabe, Haruyoshi; Kawakami, Masahiro; Takahashi, Kenji; Iwasaki, Katsuhiro; and Inoue, Shigeru, 4,961,784, Cl. 75-623.000.

Nogami, Akira: *See*—
Uehara, Masafumi; Nogami, Akira; Shimura, Kazuhiro; Yumiki, Keiichi; and Iwaki, Akio, 4,961,859, Cl. 210-725.000.

Nogami, Hiroyasu; Miike, Seiji; Takeda, Kimihito; Amano, Shin-ya; and Aoyama, Chiaki, to Kabushiki Kaisha. Language translator which automatically recognizes, analyzes, translates and reinserts comments in a sentence. 4,962,452, Cl. 364-419.000.

Nogami, Nagatoshi: *See*—
Kadokura, Hidekimi; Harakawa, Masashi; and Nogami, Nagatoshi, 4,961,889, Cl. 264-63.000.

Nogawa, Hideki: *See*—
Yamada, Yuichi; Ayata, Naoki; Suzukawa, Hiroki; and Nogawa, Hideki, 4,962,423, Cl. 358-101.000.

Nogradi, Jan. Prefabricated flexible exterior panel system. 4,961,298, Cl. 52-235.000.

Noguchi, Teruhiko: *See*—
Masuda, Jitsuo; Morimoto, Junji; Yamagishi, Ken; Kinashi, Hiroshi; Kawabata, Itaru; and Noguchi, Teruhiko, 4,962,408, Cl. 355-245.000.

Noguchi, Yoshio: *See*—
Kanai, Takashi; Kimura, Michio; and Noguchi, Yoshio, 4,962,245, Cl. 570-211.000.

Nojiri, Hidetoshi: *See*—
Uchiyama, Makoto; and Nojiri, Hidetoshi, 4,962,062, Cl. 437-225.000.

Noonan, James R.: *See*—
Doheny, Anthony J., Jr.; and Noonan, James R., 4,961,978, Cl. 428-40.000.

Norco Industries, Inc.: *See*—
Faurenhoff, Erv, 4,961,589, Cl. 280-475.000.

Nordin, Ivan C.: *See*—
Lobbestael, Sandra J.; Nordin, Ivan C.; and Fleming, Robert, 4,962,116, Cl. 514-353.000.

Norell, Maria; Dahl, Anders; and Soderberg, Ursula, to Eka Nobel AB. Process for production of chlorine dioxide. 4,961,918, Cl. 423-479.000.

Norman Dryer Company, Inc.: *See*—
Coffman, Randall R., 4,961,274, Cl. 34-133.000.

Norsolor: *See*—
Boinot, Francois; and Cousin, Michel, 4,962,166, Cl. 525-506.000.

Norsolor (Orkem Group): *See*—
Garrigue, Roger; and Lalo, Jack, 4,962,182, Cl. 528-230.000.

Northeastern University: *See*—
Nikias, Chrysostomos L.; Brooks, Dana H.; Siegel, John H.; and Fabian, Miklos, 4,961,428, Cl. 128-699.000.

Norton, Richard V.: *See*—
Detlefsen, William D.; Phillips, Earl K.; and Norton, Richard V., 4,961,795, Cl. 156-62.200.

Noschese, Rocco J., to Burndy Corporation. Vertical action contact spring. 4,961,709, Cl. 439-66.000.

Novak, Michael A.: *See*—
Coutts, Garry D.; Lautenschlager, Eugene P.; Wixson, Richard L.; and Novak, Michael A., 4,961,647, Cl. 366-139.000.

Novak, Rudy G.: *See*—
Mak, Kai K.; Novak, Rudy G.; Fox, Robert D.; and Helsen, Richard W., 4,961,391, Cl. 110-346.000.

Novinson, Thomas, to United States of America, Navy. Lanthanide oxides and phosphates for improving properties of heated refractory concrete. 4,961,786, Cl. 106-692.000.

Noyori, Ryoji: *See*—
Takaya, Hidemasa; Ohta, Tetsuo; Noyori, Ryoji; Sayo, Noboru; Kumobayashi, Hidenori; and Akutagawa, Susumu, 4,962,230, Cl. 562-433.000.
Yamada, Nobuo; Takezawa, Toshiyuki; Sayo, Noboru; Yagi, Misao; Kumobayashi, Hidenori; Akutagawa, Susumu; Takaya, Hidemasa; Inoue, Shinichi; and Noyori, Ryoji, 4,962,242, Cl. 568-822.000.

Nozaki, Nobuharu: *See*—
Hatori, Masami; and Nozaki, Nobuharu, 4,961,632, Cl. 350-358.000.

NSK-Warner Kabushiki Kaisha: *See*—
Kinoshita, Yoshio; Koshino, Shigeaki; and Sakai, Yoshiaki, 4,961,486, Cl. 192-41.00R.

Nudenberg, Walter: *See*—
Bandlish, Baldev K.; Loveless, Frederick C.; and Nudenberg, Walter, 4,962,234, Cl. 564-384.000.

Numako, Norio; and Kobayashi, Takeo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Zoom lens driving apparatus. 4,962,399, Cl. 354-195.100.

Nutz, Karl-Diether, to Telefunken electronic GmbH. Squaring circuit. 4,962,439, Cl. 361-95.000.

Oakes, Fred T.: *See*—
Levenson, Corey; Chang, Chu-an; and Oakes, Fred T., 4,962,029, Cl. 435-192.000.

Oat, Henry C., to Color-Crete. Method of coloring cement. 4,962,006, Cl. 428-703.000.

Occam Marine Technologies Ltd.: *See*—
Pace, Dan R., 4,961,724, Cl. 494-68.000.

Occidental Chemical Corporation: *See*—
Cocoman, Mary K.; and Schwartz, Willis T., 4,962,206, Cl. 549-246.000.

O'Connor, Christopher: *See*—
Miller, Gerald; and O'Connor, Christopher, 4,962,325, Cl. 307-353.000.

O'Connor, Joseph G.: *See*—
Colyer, E. Keith; O'Connor, Joseph G.; and Hammann, W. A., IV, 4,962,010, Cl. 430-138.000.

Oda, Haruo: *See*—
Sakamoto, Shunji; Usui, Junichi; and Oda, Haruo, 4,961,257, Cl. 29-823.000.

Office National D'Etudes et de Recherches Aerospatiales: *See*—
Alperine, Serge; and Josso, Pierre, 4,962,005, Cl. 428-670.000.

Ofstad, Elizabeth B.: *See*—
De Clippeleir, Georges E. M. J.; Ofstad, Elizabeth B.; and Kvisle, Steinar, 4,962,265, Cl. 585-660.000.

Ogawa, Junji: *See*—
Masuda, Yusuke; and Ogawa, Junji, 4,962,486, Cl. 365-230.030.

Ogawa, Kenichi, to Aisin Seiki Kabushiki Kaisha. Abnormal watching device and method for microcomputer. 4,962,352, Cl. 324-73.100.

Ogawa, Toshitaka: *See*—
Nemoto, Shigeo; Namikawa, Osamu; Tsuchiya, Kiyomi; Nakajima, Isao; Kikuchi, Yasuo; Sugaya, Tomio; Ogawa, Toshitaka; and Katagiri, Sigenobu, 4,961,704, Cl. 432-8.000.

Ogino, Masanori, to Hitachi, Ltd. Projection type display device for monitoring at short distance. 4,961,642, Cl. 353-38.000.

Oguma, Tomio; and Aso, Yasuhiro, to Aisin Seiki Kabushiki Kuisha. Fresh food storing device. 4,961,322, Cl. 62-179.000.

Ogura, Kenji: *See*—
Katsuna, Kiyoharu; Ogura, Kenji; and Hirata, Toshio, 4,961,323, Cl. 62-244.000.

Ohba, Tetsuya: *See*—
Kojima, Tatsuo; Kobayashi, Tatsunori; Katou, Kouki; Ohba, Tetsuya; Yatsuzuka, Takashi; and Tanabe, Koji, 4,961,261, Cl. 29-895.210.

Ohba, Toshihiro: *See*—
Fujioka, Yosihide; Kanatani, Yoshiharu; Ohba, Toshihiro; and Uede, Hisashi, 4,962,374, Cl. 340-781.000.

Ohbori, Kouzi: *See*—
Itoh, Hajime; Ohbori, Kouzi; Mitani, Kazutami; Takahashi, Hiroshi; Takehashi, Kouji; and Aoki, Kunihiro, 4,961,853, Cl. 210-500.340.

Ohdaira, Hirosi: *See*—
Iida, Atsuko; Ohdaira, Hirosi; Katsura, Masaki; Nishikawa, Reiji; and Ozawa, Norio, 4,961,979, Cl. 428-64.000.

Ohkawa, Masami: *See*—
Onodera, Kenji; and Ohkawa, Masami, 4,961,376, Cl. 101-93.140.

Ohkawa, Masanori; and Nishikawa, Yoshihiro, to SS Pharmacuetical Company, Ltd. Thiabendazole-containing antifungal composition. 4,962,093, Cl. 514-53.000.

Ohno, Kouji; Inoue, Hiromichi; Saito, Shinichi; Miyazawa, Kazutoshi; and Ushioda, Makoto, to Chisso Corporation. Condensate of an optically active-4-(1-hydroxyethyl)biphenyl with an optically active organic acid. 4,961,875, Cl. 252-299.660.

Ohta, Tetsuo: *See*—
Takaya, Hidemasa; Ohta, Tetsuo; Noyori, Ryoji; Sayo, Noboru; Kumobayashi, Hidenori; and Akutagawa, Susumu, 4,962,230, Cl. 562-433.000.

Ohta, Yuji: *See*—
Murata, Yoshitoshi; Ohta, Yuji; Yotsutani, Akio; Hara, Toshihiro; Ono, Koji; and Fuse, Shoji, 4,962,524, Cl. 379-61.000.

Ohtani, Hitoshi: *See*—
Ohtomo, Fumio; Frusho, Hiroyuki; and Ohtani, Hitoshi, 4,962,422, Cl. 358-88.000.

Ohtomo, Fumio; Frusho, Hiroyuki; and Ohtani, Hitoshi, to Kabushiki Kaisha TOPCON. Stereoscopic image display apparatus. 4,962,422, Cl. 358-88.000.

Ohtsuka, Hiroshi: *See*—
Komatsu, Fumiaki; Sakamoto, Junichi; Fujimoto, Hitoshi; Ohtsuka, Hiroshi; Saigusa, Kazuyuki; Kabasawa, Akifumi; Yokodate, Shinya; and Kashiwagi, Kenichi, 4,962,521, Cl. 379-53.000.

Ohtsuka, Shuichi; and Yamana, Keiichi, to Fuji Photo Film Co., Ltd. Selective retrieval of data from microfilm images of different forms by reading a memory index form cord (bar code) recorded on each image frame. 4,962,432, Cl. 358-302.000.

Ohyama, Nagaaki: *See*—
Tsujiuchi, Junpei; Ikeda, Shigeto; Honda, Toshio; Ohyama, Nagaaki; Badique, Eric; and Kikuchi, Susumu, 4,962,540, Cl. 382-17.000.

Ojima, Tutomu: *See*—
Kato, Yoshiaki; Yuyama, Harumi; Ojima, Tutomu; and Ishikawa, Hiromi, 4,962,485, Cl. 365-229.000.

Okada, Kazuo: *See*—
Imai, Hitoshi; and Okada, Kazuo, 4,962,479, Cl. 365-119.000.

Okada, Masahiro; and Matsumoto, Hiroki, to Ikeda Bussan Co., Ltd. Gear structure. 4,961,353, Cl. 74-457.000.

Okada, Yoshio; Kawasaki, Koichi; and Iguchi, Shin, to Watanabe, Hidehiko. Aspartic acid derivatives. 4,962,225, Cl. 560-163.000.

Okada, Yoshio; Imada, Sadao; and Shimizu, Mitsuru, to Kabushiki Kaisha Toshiba. Input protection circuit for MOS device. 4,962,320, Cl. 361-56.000.

Okada, Yukio: *See*—
Bando, Masaki; Sukegawa, Kenichi; Yamada, Hiromiti; Masuda, Mitsutsugu; Okada, Yukio; Yukawa, Mitsuyoshi; and Sato, Nobuyuki, 4,961,377, Cl. 101-128.210.

O'Kain, Alan N.: *See*—
Burroughs, James R.; and O'Kain, Alan N., 4,962,347, Cl. 320-48.000.
Okamoto, Kikuhiko: *See*—
Kawai, Shuji; Oshino, Kazushi; Okoshi, Hiromi; Mori, Hajime; Ozaki, Katsuya; Shikata, Shitsuw; Ito, Susumu; and Okamoto, Kikuhiko, 4,962,030, Cl. 435-209.000.
Okamoto, Masato: *See*—
Fujita, Masahiko; Shishido, Yuuji; Suzuki, Yuzuru; and Okamoto, Masato, 4,962,329, Cl. 310-208.000.
Okamoto, Sumiko: *See*—
Shinjo, Masayoshi; Okamoto, Sumiko; Katakura, Yasuko; and Takubo, Seiji, 4,962,156, Cl. 525-100.000.
Oki Electric Industry Co, Ltd.: *See*—
Yamazaki, Seiichi; Inoue, Hiroaki; Takashima, Sumihiro; and Shishikura, Hiroshisa, 4,962,413, Cl. 357-42.000.
Okoshi, Hiromi: *See*—
Kawai, Shuji; Oshino, Kazushi; Okoshi, Hiromi; Mori, Hajime; Ozaki, Katsuya; Shikata, Shitsuw; Ito, Susumu; and Okamoto, Kikuhiko, 4,962,030, Cl. 435-209.000.
Okumura, Mitsuhiro: *See*—
Chino, Shigeo; and Okumura, Mitsuhiro, 4,962,016, Cl. 430-603.000.
Okuno, Akiyasu; Watanabe, Masakazu; and Ikoma, Kazuhiko, to NGK Spark Plug Co., Ltd. Aluminum nitride sintered body with high thermal conductivity and process for producing same. 4,961,987, Cl. 428-209.000.
Okuno, Takeshi; and Ishiyama, Kiyoshige, to Shinko Denki Kabishiki Kaisha. Thermal head supporting means for a thermal printing system. 4,962,392, Cl. 346-145.000.
Okushita, Masataka: *See*—
Shoji, Iwao; and Okushita, Masataka, 4,961,518, Cl. 222-107.000.
Okuya, Tsutae; and Hayashida, Tsuguhisa, to Alps Electric Co., Ltd. Illuminating type linear resistor for volume control. 4,962,364, Cl. 338-119.000.
Oldiges, John H.: *See*—
Reeder, Ryan A.; Bester, David C.; and Oldiges, John H., 4,961,610, Cl. 297-412.000.
Olin Corporation: *See*—
Lin, Lifun; and Polan, Ned W., 4,961,828, Cl. 204-27.000.
Watson, William G.; and Ashok, Sankaranarayanan, 4,961,457, Cl. 164-46.000.
Olympus Optical Co., Ltd.: *See*—
Kubota, Tatsuya; Gotanda, Masakazu; Hatta, Shinji; Karasawa, Hitoshi; Kubota, Tetsumaru; Nakamura, Takeaki; Takayama, Syuichi; and Sasaki, Hiroshi, 4,961,424, Cl. 128-24.00A.
Rokutan, Takao, 4,962,301, Cl. 235-487.000.
Tsujiuchi, Junpei; Ikeda, Shigeto; Honda, Toshio; Ohyama, Nagaaki; Badique, Eric; and Kikuchi, Susumu, 4,962,540, Cl. 382-17.000.
Oman, John E.: *See*—
Berg, Marvin I.; Mihail, Stavros; and Oman, John E., 4,961,446, Cl. 141-144.000.
Onaga, Eimei M.: *See*—
Daggett, Kenneth E.; Onaga, Eimei M.; Casler, Richard J., Jr.; Booth Barrett L.; and Jalbert, Vincent P., 4,962,338, Cl. 318-568.110.
O'Neil, Gregory R.: *See*—
Perez, Jesus W.; Barrois, Melvin J.; McCord, Thomas H.; and O'Neil, Gregory R., 4,961,777, Cl. 75-313.000.
O'Neill, Gerald J.; and Holdsworth, Robert S., to W. R. Grace & Co.-Conn. Bis (difluoromethyl) ether refrigerant. 4,961,321, Cl. 62-114.000.
Ong, Lance: *See*—
Teller, David M.; Sheryll, Richard; and Ong, Lance, 4,961,533, Cl. 177-25.190.
Ono, Haruo; Kinoshita, Satoshi; and Suga, Fusao, to Casio Computer Co., Ltd. Exercise measuring instrument. 4,962,469, Cl. 364-561.000.
Ono, Koji: *See*—
Murata, Yoshitoshi; Ohta, Yuji; Yotsutani, Akio; Hara, Toshihiro; Ono, Koji; and Fuse, Shoji, 4,962,524, Cl. 379-61.000.
Onodera, Chikau: *See*—
Kitagawa, Kiyoshi; Hosoi, Yoshio; Sogawa, Akira; Onodera, Chikau; and Onuma, Tadashi, 4,961,435, Cl. 128-788.000.
Onodera, Kenji; and Ohkawa, Masami, to Seiko Epson Corporation. Printer. 4,961,376, Cl. 101-93.140.
Onuma, Tadashi: *See*—
Kitagawa, Kiyoshi; Hosoi, Yoshio; Sogawa, Akira; Onodera, Chikau; and Onuma, Tadashi, 4,961,435, Cl. 128-788.000.
Ooumi, Manabu; Sakuhara, Toshihiko; and Ataka, Tatsuaki, to Seiko Instruments, Inc. Memory reading apparatus. 4,962,480, Cl. 365-151.000.
Orikasa, Yuichi; Sakazume, Suehiro; Nishimura, Sadahiro; and Maki, Yoshinori, to Nippon Petrochemicals Co., Ltd; and Nippon Oil & Fats Co., Ltd. Thermoplastic resin composition and method for preparing the same. 4,962,148, Cl. 524-504.000.
Orlandi, Daniel A.: *See*—
Cherukuri, Subraman R.; Orlandi, Daniel A.; Faust, Steven M.; and Zamudio-Tena, J. Francisco, 4,961,935, Cl. 426-3.000.
Orlando, Ramon A., to University of British Columbia. Therapeutic diaper. 4,961,737, Cl. 604-385.200.
Orthopedic Systems, Inc.: *See*—
Moore, Robert; and Lamb, Steven, 4,961,416, Cl. 128-80.00C.
Osberghaus, Rainer: *See*—
Kresse, Franz; Osberghaus, Rainer; Scheller, Bernfrid; Schunter, Roland; and Tuchermann, Herta, 4,961,242, Cl. 15-228.000.
Osborn, David C.: *See*—
Goldberg, Eugene P.; Burns, James W.; Kumar, G. Sudesh; Osborn, David C.; Larson, Jeffrey A.; Sheets, John W.; Yahiaoui, Ali; and Robinson, Richard, 4,961,954, Cl. 427-2.000.
Oshiage, Katsunori; and Nanyoshi, Yasutoshi, to Nissan Motor Company, Limited. Fuel control apparatus. 4,961,411, Cl. 123-492.000.
Oshima, Nobuyuki, to Alps Electric Co., Ltd. Flexible printed wire board. 4,962,287, Cl. 174-261.000.
Oshino, Kazushi: *See*—
Kawai, Shuji; Oshino, Kazushi; Okoshi, Hiromi; Mori, Hajime; Ozaki, Katsuya; Shikata, Shitsuw; Ito, Susumu; and Okamoto, Kikuhiko, 4,962,030, Cl. 435-209.000.
Ostbo, Karl. Heat exchanger. 4,962,296, Cl. 219-306.000.
Ostrup, Heinrich; and Sanders, Lambert, to Claas OHG. Agricultural implement for harvesting of corn and other grain fruits. 4,961,305, Cl. 56-98.000.
Osuch, Christopher E.; and McFarland, Michael J., to Hoechst Celanese Corporation. Blocked monomer and polymers therefrom for use as photoresists. 4,962,171, Cl. 526-266.000.
O'Sullivan, Eugene J.: *See*—
Gallagher, William J.; Giess, Edward A.; Gupta, Aranava; Laibowitz, Robert B.; O'Sullivan, Eugene J.; and Sandstrom, Robert L., 4,962,086, Cl. 505-1.000.
O'Sullivan, Mark H. Dried product obtained from processing of sugar cane. 4,961,952, Cl. 426-615.000.
Otani, Masaru: *See*—
Yokozeki, Kenzo; Shirae, Hideyuki; Shiragami, Hiroshi; Irie, Yasuo; Yasuda, Naohiko; Otani, Masaru; and Tanabe, Toshiya, 4,962,193, Cl. 536-24.000.
Otani, Tadashi; Meguro, Hiroshi; and Kosaka, Toru, to Nikon Corporation. Zooming control device for camera. 4,962,400, Cl. 354-195.100.
Otsuka, Reiko: *See*—
Kobayashi, Masao; and Otsuka, Reiko, 4,962,158, Cl. 525-279.000.
Otsuki, Toshinori; and Nakamura, Takuji, to Matsushita Electric Industrial Co., Ltd. Method of manufacturing a lens array for reading information. 4,961,802, Cl. 156-153.000.
Ott, Hans: *See*—
Schrammli, Fortunat; Berner, Markus; and Ott, Hans, 4,961,646, Cl. 356-328.000.
Ott, Heidrun; and Kuhlmann, Werner, to Blendax GmbH. Dental impression material. 4,962,134, Cl. 523-109.000.
Ottengraf, Simon P. P.; and Wijers, Johannes G., to Nijhuis Water B. V. Throttling device and method for feeding gas dissolved in liquid under high pressure into liquid under low pressure. 4,961,857, Cl. 210-703.000.
Ou, Jan-Chou. Rear view lens apparatus for automotive vehicle. 4,961,637, Cl. 350-573.000.
Ou, John D., to UOP. Process for separating triglycerides and regenerating absorbent used in said separation process. 4,961,881, Cl. 260-428.500.
Oura, Takeshi: *See*—
Mita, Ryuichi; Katoh, Toshio; Higuchi, Chojiro; Oura, Takeshi; and Yamaguchi, Akihiro, 4,962,222, Cl. 560-41.000.
Ovens, Ronald K. Post hold digger. 4,961,471, Cl. 175-170.000.
Ovonic Imaging Systems, Inc.: *See*—
Baron, Yair; and Yaniv, Zvi, 4,961,630, Cl. 350-333.000.
Ovsborn, Jesse H.; and Hahn, Robert W., to J. I. Case Company. Cotton flow monitoring system for a cotton harvester. 4,961,304, Cl. 56-10.200.
Owechko, Yuri; and Soffer, Bernard H., to Hughes Aircraft Company. Associative memory system with spatial light modulator. 4,961,615, Cl. 350-3.680.
Owen, Hartley: *See*—
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,961,907, Cl. 422-144.000.
Owens-Corning Fiberglas Corporation: *See*—
Dunbar, Sidney, 4,961,700, Cl. 425-394.000.
Owens-Illinois Plastic Products Inc.: *See*—
Jabarin, Saleh A.; and Balduff, Dennis C., 4,962,164, Cl. 525-445.000.
Owens, Steven F.: *See*—
Spraggins, Thomas A.; and Owens, Steven F., 4,961,426, Cl. 128-653.00A.
Ozaki, Katsuya: *See*—
Kawai, Shuji; Oshino, Kazushi; Okoshi, Hiromi; Mori, Hajime; Ozaki, Katsuya; Shikata, Shitsuw; Ito, Susumu; and Okamoto, Kikuhiko, 4,962,030, Cl. 435-209.000.
Ozawa, Norio: *See*—
Iida, Atsuko; Ohdaira, Hirosi; Katsura, Masaki; Nishikawa, Reiji; and Ozawa, Norio, 4,961,979, Cl. 428-64.000.
P.B. & S. Chemical Company, Inc.: *See*—
Clements, James L., 4,961,749, Cl. 8-109.000.
Pace, Dan R., to Occam Marine Technologies Ltd. Low speed particle concentrators. 4,961,724, Cl. 494-68.000.
Pace National Corporation: *See*—
Gurvich, Max A.; Parent, Robert W.; and Brandli, Eugene H., 4,961,929, Cl. 424-196.100.
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Rhoades, Charles S.: *See*—
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Rhodes, James F.; Dziedzic, Chester J.; and Beatty, Ronald L., to Advanced Composite Materials Corporation. Reinforced ceramic cutting tools. 4,961,757, Cl. 51-309.000.
Rhone-Poulenc Basic Chemicals Co.: *See*—
Roberts, Auston K.; Trainer, William E.; Blumenfeld, Mark L.; and Biederman, David L., 4,961,912, Cl. 423-322.000.
Rich, John W., Jr. Fluidized-bed combustion fuel. 4,961,756, Cl. 44-605.000.
Richardson, Bennie L.: *See*—
Pavel, James; and Richardson, Bennie L., 4,961,311, Cl. 60-39.182.
Richardson, Charles C.: *See*—
Tabor, Stanley; and Richardson, Charles C., 4,962,020, Cl. 435-6.000.
Richter, Siegfried. Breast milk pump. 4,961,726, Cl. 604-74.000.
Ricoh Company, Ltd.: *See*—
Imakawa, Susumu; Takeyama, Yoshinobu; Kubo, Nobuaki; and Saitoh, Masanori, 4,962,431, Cl. 358-296.000.
Murai, Kazuo, 4,962,421, Cl. 358-76.000.
Nakaya, Masahide, 4,962,307, Cl. 250-324.000.
Sakamoto, Teruo, 4,961,527, Cl. 226-74.000.
Sohmiya, Norimasa; Koichi, Yasushi; and Karasawa, Kazunori, 4,962,394, Cl. 346-160.100.
Riediker, Martin; Roth, Martin; Buhler, Niklaus; and Berger, Joseph, to Ciba-Geigy Corporation. Process for producing photographic relief images using photopolymerizable compositions containing fluorinated titanocenes. 4,962,012, Cl. 430-311.000.
Riedl, Reinhold; and Lazarus, Conrad, to Haacon Hebetechnik GmbH. Device for lifting and depositing transportable large containers, e.g. compartments or the like. 4,961,680, Cl. 414-458.000.
Rifar S.R.L.: *See*—
Marsili, Leonardo, 4,962,195, Cl. 540-230.000.
Right, Robert W.: *See*—
Dobrzanski, John J.; McCabe, Jeffrey J.; and Right, Robert W., 4,962,368, Cl. 340-514.000.
Rikagaku Kenkyusho: *See*—
Horikoshi, Koki; Kudo, Toshiaki; and Kato, Chiaki, 4,962,055, Cl. 435-252.800.
Rioja, Roberto J.; Cho, Alex; and Bretz, Philip E., to Aluminum Company of America. Aluminum-lithium alloys having improved corrosion resistance containing Mg and Zn. 4,961,792, Cl. 148-12.70A.
Risko, Frank D.; and Lewis, Thomas D., to Elopak Systems A.G. Transfer mechanism with jam detector. 4,961,490, Cl. 198-433.000.
Risley, Lonnie F.: *See*—
Ross, Gilbert B.; and Risley, Lonnie F., 4,961,995, Cl. 428-409.000.
Riso Kagaku Corporation: *See*—
Bando, Masaki; Sukegawa, Kenichi; Yamada, Hiromiti; Masuda, Mitsutsugu; Okada, Yukio; Yukawa, Mitsuyoshi; and Sato, Nobuyuki, 4,961,377, Cl. 101-128.210.
Rivier, Paul: *See*—
Duborper, Alain; Miquelot, Gilles; Rivier, Paul; and Rosset, Roger, 4,962,299, Cl. 219-492.000.
Robbins, Kenneth E.: *See*—
Moore, James H.; Retzlaff, Klaus M.; and Robbins, Kenneth E., 4,961,310, Cl. 60-39.182.
Roberge, Raymond F. Arm levers for total exercise stationary cycles. 4,961,569, Cl. 272-73.000.
Robert, Kearny Q.: *See*—
Sawhney, A. Paul S.; Folk, Craig L.; Robert, Kearny Q.; and Kimmel, Linda B., 4,961,306, Cl. 57-12.000.
Robert Shaw Controls Company: *See*—
Wagner, Joseph P., 4,961,530, Cl. 236-34.500.
Roberts, Auston K.; Trainer, William E.; Blumenfeld, Mark L.; and Biederman, David L., to Rhone-Poulenc Basic Chemicals Co. Passivation of elemental phosphorus contained in waste ponds. 4,961,912, Cl. 423-322.000.
Roberts, Derek D.: *See*—
Sanders, Mark A.; and Roberts, Derek D., 4,961,593, Cl. 280-646.000.
Roberts, James E.: *See*—
Suarez, Francis S.; Roberts, James E.; Kamdar, Vinayak P.; Hyatt, James R.; and Lowe, Lloyd A., 4,961,563, Cl. 266-229.000.
Roberts, John S.; and Shioyama, Tod K., to Phillips Petroleum Company. Oxa-organic sulfur compounds, their preparation and use. 4,962,169, Cl. 526-209.000.
Roberts, Kent S., to Roberts Mfg., Inc. Sight mounting device for archery bows. 4,961,265, Cl. 33-265.000.
Roberts Mfg., Inc.: *See*—
Roberts, Kent S., 4,961,265, Cl. 33-265.000.
Robinson, Richard: *See*—
Goldberg, Eugene P.; Burns, James W.; Kumar, G. Sudesh; Osborn, David C.; Larson, Jeffrey A.; Sheets, John W.; Yahiaoui, Ali; and Robinson, Richard, 4,961,954, Cl. 427-2.000.
Rock, Erich, to Julius Blum Gesellschaft m.b.H. Drawer including improved lateral and vertical adjustment assembly. 4,961,614, Cl. 312-341.100.
Rock, Erich, to Julius Blum Gesellschaft m.b.H. Pull-out guide assembly for drawers or the like. 4,961,648, Cl. 384-19.000.
Rockwell International Corporation: *See*—
Adams, William; DellaRovere, R. H.; and Courter, Barbara G. J., 4,961,548, Cl. 244-118.500.
Balow, Frank A.; Enstrom, Edward; and Skiper, Eugene, r., 4,961,378, Cl. 101-142.000.
Flanagan, Joseph E.; and Woolery, Dean O., II, 4,961,380, Cl. 102-287.000.
Frankel, Milton B.; Wilson, Edgar R.; and Woolery, Dean O., II, 4,962,213, Cl. 552-12.000.
Stapelbroek, Maryn G.; Petroff, Michael D.; and Bharat, Ramasesha, 4,962,304, Cl. 250-211.00J.
Swain, David M.; Needham, Gregory A.; and Fontana, Louis R., 4,961,627, Cl. 350-319.000.
White, Frederic H., III; Hu, Patrick H.; and Bettis, Jerry R., 4,962,309, Cl. 250-396.00R.
Rodder, Jerome A. Multiple tube flowmeter. 4,961,344, Cl. 73-202.000.
Rodriguez, Domingo: *See*—
Velasco, Leon; Mota, Carlos; and Rodriguez, Domingo, 4,961,837, Cl. 208-41.000.
Roedel, Gunther: *See*—
Schlemmer, Gerhard C. U.; Tamm, Rolf; and Roedel, Gunther, 4,961,645, Cl. 356-312.000.
Roeper, Michael; Bertleff, Werner; and Koeffer, Dieter, to BASF Aktiengesellschaft. Preparation of octadienols. 4,962,243, Cl. 568-909.500.
Roger, Francoise M. M.: *See*—
Carre, Alain R. E.; and Roger, Francoise M. M., 4,961,996, Cl. 428-421.000.
Rogers, Edward S.: *See*—
Eissele, Ernest M.; Rogers, Edward S.; and Reidies, Arno H., 4,961,751, Cl. 8-111.000.
Roginski, Edward T., to Medical Automation Specialities, Inc. Method and apparatus for automatic processing and analyzing of blood serum. 4,962,041, Cl. 436-150.000.
Rohm GmbH: *See*—
Christner, Juergen; Pfleiderer, Ernst; Taeger, Tilman; and Wick, Gertrud, 4,961,750, Cl. 8-94.270.
Rohm and Haas Company: *See*—
Bortnick, Newman M.; and Lin, Long-Jin, 4,962,165, Cl. 525-479.000.
Rohrmann, Jurgen: *See*—
Winter, Andreas; Antberg, Martin; and Rohrmann, Jurgen, 4,962,248, Cl. 585-12.000.
Winter, Andreas; Antberg, Martin; and Rohrmann, Jurgen, 4,962,262, Cl. 585-512.000.

Rokurohta, Haruyasu; and Ishiyama, Kazufumi, to Kabushiki Kaisha Toshiba. Ultrasonic probe and method of manufacturing the same. 4,962,332, Cl. 73-632.000.

Rokutan, Takao, to Olympus Optical Co., Ltd. Method of reciprocally recording data on card-like record medium for unidirectional reading. 4,962,301, Cl. 235-487.000.

Roocks, Christiane: *See*—
Kuhn, Uwe; Roocks, Christiane; and Kiesele, Herbert, 4,961,834, Cl. 204-412.000.

Roos, Jan: *See*—
Kramer, Pieter; and Roos, Jan, 4,962,493, Cl. 369-44.110.

Rose, Harald, to Carl-Zeiss-Stiftung. Wien-type imaging corrector for an electron microscope. 4,962,313, Cl. 250-311.000.

Rose, John: *See*—
Nelson, Gerald J.; Stommes, Wally; and Rose, John, 4,962,290, Cl. 200-308.000.

Rose, Rene , to Schlumberger Industries. Method for manufacturing memory cards. 4,961,893, Cl. 264-247.000.

Rosen, Harold A., to Hughes Aircraft Company. Stabilization of a spinning spacecraft of arbitary shape. 4,961,551, Cl. 244-164.000.

Rosen, Terry J.; and Chu, Daniel T., to Abbott Laboratories. 7-(2-methyl-4-aminopyrrolidinyl)naphthryidine and quinoline compounds. 4,962,112, Cl. 514-300.000.

Rosenbaum, Nathan. Quick release safety device for handguns. 4,961,277, Cl. 42-70.110.

Roske, Eckhard: *See*—
Paul, Axel; Tonne, Peter; Roske, Eckhard; and Siegel, Hardo, 4,962,231, Cl. 562-575.000.

Ross, Gilbert B.; and Risley, Lonnie F. Polishable, flame retarded, synthetic mineral product. 4,961,995, Cl. 428-409.000.

Ross, Robert E.: *See*—
Cocco, Mark V.; Ross, Robert E.; and Thulin, Robert R., 4,961,941, Cl. 426-94.000.
Cocco, Mark V.; Ross, Robert E.; and Thulin, Robert R., 4,961,942, Cl. 426-94.000.

Rosset, Roger: *See*—
Duborper, Alain; Miquelot, Gilles; Rivier, Paul; and Rosset, Roger, 4,962,299, Cl. 219-492.000.

Rossman, Randall R.: *See*—
Mallams, Alan K.; Rossman, Randall R.; Sarre, Olga; Girijavallabhan, Viyyoor M.; and Ganguly, Ashit K., 4,962,146, Cl. 514-30.000.

Rotation Limited: *See*—
Barnes, David; and Sharp, Alick M., 4,961,581, Cl. 273-236.000.

Roth, Martin: *See*—
Riediker, Martin; Roth, Martin; Buhler, Niklaus; and Berger, Joseph, 4,962,012, Cl. 430-311.000.

Rowland Institute for Science: *See*—
Foley, James W.; and Cincotta, Louis, 4,962,197, Cl. 544-31.000.

Rozner, Alexander G.: *See*—
Fishman, Steven G.; Rozner, Alexander G.; Wiley, Raymond C.; and Wishard, William N., 4,961,383, Cl. 102-517.000.

Rubin, David, to Century Laboratories, Inc. Process for preparation of oil-free fish meal and recovery of polyunsaturated fatty acids. 4,961,936, Cl. 426-7.000.

Rubin, Mae K.: *See*—
Le, Quang N.; Marler, David O.; McWilliams, John P.; Rubin, Mae K.; Shim, Joosup; and Wong, Stephen S., 4,962,256, Cl. 585-467.000.

Rudel, Harry W. A composition of flours containing vital gluten and soluble oat dietary fiber and a baked product produced therefrom. 4,961,937, Cl. 426-19.000.

Runyon, Dennis R.: *See*—
Taylor, Jimmy; Singleton, David L.; Skeens, Stanley A.; and Runyon, Dennis R., 4,961,722, Cl. 494-36.000.

Russell, Samuel S.: *See*—
Holderfield, Daron C.; Martin, Bernard E.; and Russell, Samuel S., 4,962,355, Cl. 324-158.00F.

Russell, Scott M.: *See*—
Law, Chi C.; and Russell, Scott M., 4,961,905, Cl. 420-460.000.

Ryer, Richard N., II; and Fetta, Jeffrey E., to Platt Saco Lowell Corporation. Strand tension compensator. 4,961,546, Cl. 242-154.000.

Ryobi Motor Products Corp.: *See*—
Barnes, James F., Jr.; Herron, Roy H., Jr.; and Hughes, Steven K., 4,961,245, Cl. 15-339.000.

Rytlewski, Gary L., to Schlumberger Technology Corporation. Perforating gun with rotating charges including a mechanical link retaining mechanism. 4,961,365, Cl. 89-1.150.

Saavedra, Steven S.: *See*—
Picozza, Enrico G.; and Saavedra, Steven S., 4,962,045, Cl. 436-501.000.

Sachsenwerk Aktiengesellschaft: *See*—
Stegmuller, Karl, 4,962,289, Cl. 200-144.00B.

Sachtler, Johann W. A.; Lawson, Randy J.; and Lambert, Susan L., to UOP. Catalyst for isomerizing alkylaromatics. 4,962,259, Cl. 585-480.000.

Sacks, David B.: *See*—
Fujita-Yamaguchi, Yoko; McDonald, Jay M.; and Sacks, David B., 4,962,155, Cl. 525-54.100.

Sadler, Robert A.: *See*—
Geissberger, Arthur E.; Sadler, Robert A.; Menk, Gregory E.; and Balzan, Matthew L., 4,962,050, Cl. 437-22.000.

Sadowski, John S.: *See*—
Iacoviello, John G.; Davidowich, George; Vijayendran, Bheema R.; and Sadowski, John S., 4,962,141, Cl. 524-92.000.

Saeki, Keiso: *See*—
Washizu, Shintaro; Yamaguchi, Jun; Shinozaki, Fumiaki; Shimomura, Akihiro; Usami, Toshimasa; Endo, Toshiaki; and Saeki, Keiso, 4,962,009, Cl. 430-138.000.

Saeki, Yoshifumi; and Watanabe, Shigeru, to Pioneer Electronic Corporation. Scrambling method for TV picture. 4,962,529, Cl. 380-15.000.

Saha, Chandan K.: *See*—
Burns, Gary T.; Saha, Chandan K.; and Keller, Ronald J., 4,962,069, Cl. 501-90.000.

Saigusa, Kazuyuki: *See*—
Komatsu, Fumiaki; Sakamoto, Junichi; Fujimoto, Hitoshi; Ohtsuka, Hiroshi; Saigusa, Kazuyuki; Kabasawa, Akifumi; Yokodate, Shinya; and Kashiwagi, Kenichi, 4,962,521, Cl. 379-53.000.

Saishojo, Toshihide: *See*—
Enari, Hiroyuki; Kumazawa, Satoru; Shimizu, Susumu; Ito, Atsushi; Sato, Nobuo; and Saishojo, Toshihide, 4,962,278, Cl. 514-399.000.

Saito, Hideo, to Canon Kabushiki Kaisha. Printer with automatic type wheel exchanging. 4,961,655, Cl. 400-171.000.

Saito, Hirohiko: *See*—
Tokura, Norihito; Kuno, Hironari; Ito, Hiroyasu; Saito, Hirohiko; and Hara, Kunihiko, 4,962,411, Cl. 357-23.400.

Saito, Keizo; and Watanabe, Masanobu, to Sharp Kabushiki Kaisha. Character processor provided with dot pattern correcting function. 4,962,465, Cl. 364-518.000.

Saito, Shinichi: *See*—
Ohno, Kouji; Inoue, Hiromichi; Saito, Shinichi; Miyazawa, Kazutoshi; and Ushioda, Makoto, 4,961,875, Cl. 252-299.660.

Saito, Sukeo: *See*—
Nagase, Moriharu; Shibuya, Mutsumi; Asami, Kuniaki; Matsumoto, Katsuo; Teranishi, Hikaru; and Saito, Sukeo, 4,962,043, Cl. 436-165.000.

Saitoh, Masanori: *See*—
Imakawa, Susumu; Takeyama, Yoshinobu; Kubo, Nobuaki; and Saitoh, Masanori, 4,962,431, Cl. 358-296.000.

Sakabe, Yukio: *See*—
Kobayashi, Shouzo; Takagi, Hiroshi; and Sakabe, Yukio, 4,961,835, Cl. 204-427.000.

Sakai, Izumi; Donaldson, Gabriel; and Chilton, Nicholas J., to Lucas Industries Public Limited Company. Method of and apparatus for measuring speed. 4,961,643, Cl. 356-28.000.

Sakai, Tadashi; Uno, Shigeki; Koyama, Masao; and Nakamura, Nanao, to Kabushiki Kaisha Toshiba. Field-effect transistor-type semiconductor sensor. 4,961,833, Cl. 204-403.000.

Sakai, Yoshiaki: *See*—
Kinoshita, Yoshio; Koshino, Shigeaki; and Sakai, Yoshiaki, 4,961,486, Cl. 192-41.00R.

Sakamoto, Junichi: *See*—
Komatsu, Fumiaki; Sakamoto, Junichi; Fujimoto, Hitoshi; Ohtsuka, Hiroshi; Saigusa, Kazuyuki; Kabasawa, Akifumi; Yokodate, Shinya; and Kashiwagi, Kenichi, 4,962,521, Cl. 379-53.000.

Sakamoto, Shunji; Usui, Junichi; and Oda, Haruo, to Mazda Motor Corporation; and Daifuku Company, Ltd. Door assembling apparatus for use in automobile assembly. 4,961,257, Cl. 29-823.000.

Sakamoto, Teruo, to Ricoh Company, Ltd. Paper transporting tractor for printers. 4,961,527, Cl. 226-74.000.

Sakane, Hiroko: *See*—
Hagiya, Koji; Suzukamo, Gohfu; Fukao, Masami; and Sakane, Hiroko, 4,962,233, Cl. 562-866.000.

Sakato, Kuniaki: *See*—
Tsujino, Yoshio; Yokoo, Yoshiharu; Sakato, Kuniaki; and Hagino, Hiroshi, 4,961,925, Cl. 424-71.000.

Sakato, Masahiko: *See*—
Sakato, Seiichi; Sakato, Masahiko; Matsui, Kunihiko; and Watanabe, Nobuo, 4,961,543, Cl. 241-266.000.

Sakato, Seiichi; Sakato, Masahiko; Matsui, Kunihiko; and Watanabe, Nobuo, to Kabushiki Kaisha Sakato Kosakusho. Rotation adjusting apparatus in a crusher. 4,961,543, Cl. 241-266.000.

Sakazume, Suehiro: *See*—
Orikasa, Yuichi; Sakazume, Suehiro; Nishimura, Sadahiro; and Maki, Yoshinori, 4,962,148, Cl. 524-504.000.

Sakhpara, Dilip J.: *See*—
Henn, Robert L.; Sakhpara, Dilip J.; Bailey, Christian E.; Bowser, John J.; and Brown, Peter L., 4,961,985, Cl. 428-196.000.

Sakuhara, Toshihiko: *See*—
Ooumi, Manabu; Sakuhara, Toshihiko; and Ataka, Tatsuski, 4,962,480, Cl. 365-151.000.

Salmon, Roger: *See*—
McDonald, Edward; Salmon, Roger; and Whittle, Alan J., 4,962,109, Cl. 514-256.000.

Salomon, S.A.: *See*—
Bejean, Alain; and Graillat, Gerard, 4,961,591, Cl. 280-607.000.
Diard, Jean-Luc; and Guers, Francois, 4,961,592, Cl. 280-609.000.

Salter, Stuart C. Method and system for controlling a pressure regulator. 4,961,441, Cl. 137-14.000.

Salvado, Carlos A.; and Wade, Bruce E., to Expert System Technologies, Inc., The. Apparatus for performing ultrasonic measurements. 4,961,346, Cl. 73-644.000.

Salzmann, Thomas N.: *See*—
DiNinno, Frank P.; and Salzmann, Thomas N., 4,962,101, Cl. 514-210.000.

SamSung Electronics Co., Ltd.: *See*—
Choi, Jung-Hyuk; Lee, Soo-Chul; and Yim, Hyung-Kyu, 4,962,481, Cl. 365-185.000.

Samsung Electronics, Ltd.: *See*—
Park, Hee-Choul, 4,962,324, Cl. 307-350.000.

Samurin, Norman A.: *See*—
Ferri, James; and Samurin, Norman A., 4,961,260, Cl. 29-888.025.
Sanada, Toru: *See*—
Kimura, Shinta; and Sanada, Toru, 4,962,535, Cl. 381-43.000.
Sander, Craig S.: *See*—
Haskell, Jacob D.; Sander, Craig S.; Avanzino, Steven C.; and Gupta, Subhash, 4,962,064, Cl. 437-228.000.
Sanders Associates, Inc.: *See*—
Gerrie, Richard W.; and Dahlgren, Victor F., 4,961,806, Cl. 156-252.000.
Sanders, Edgar S., Jr.: *See*—
Beck, Henry N.; Sanders, Edgar S., Jr.; and Lipscomb, G. Glenn, II, 4,962,131, Cl. 521-51.000.
Sanders, Lambert: *See*—
Ostrup, Heinrich; and Sanders, Lambert, 4,961,305, Cl. 56-98.000.
Sanders, Mark A.; and Roberts, Derek D., to Acushnet Limited. Golf trolley. 4,961,593, Cl. 280-646.000.
Sandford, Philip: *See*—
Butler, David R.; Snow, George; Sandford, Philip; Neu, Max G.; Villani, Jean P.; Teyssedre, Alain; and Lenoir, Roland, 4,961,460, Cl. 164-134.000.
Sandpiper Computer & Model Services Limited: *See*—
Sheffield, Lance R., 4,961,299, Cl. 52-806.000.
Sandstrom, Robert L.: *See*—
Gallagher, William J.; Giess, Edward A.; Gupta, Aranava; Laibowitz, Robert B.; O'Sullivan, Eugene J.; and Sandstrom, Robert L., 4,962,086, Cl. 505-1.000.
Sandvik AB: *See*—
Larsson, Kenneth L.; and Liljebrand, Sven P., 4,961,469, Cl. 173-163.000.
Lindberg, Hans E., 4,961,672, Cl. 408-144.000.
Sandvik Special Metals Corporation: *See*—
Meredith, Steven E., 4,961,576, Cl. 273-80.00B.
Sansone, Ronald P.; Taylor, Michael P.; and Doeberl, Terrence M., to Pitney Bowes Inc. Batch mailing method and apparatus: printing unique numbers on mail pieces and statement sheet. 4,962,454, Cl. 364-464.020.
Santa Barbara Research Center: *See*—
Jack, Michael D., 4,962,316, Cl. 250-336.200.
Santa Fe International Corporation: *See*—
Recalde, Carlos E., 4,961,671, Cl. 405-168.000.
Santangelo, John A.: *See*—
Kees, George, Jr.; Worrick, Charles B., III; and Santangelo, John A., 4,961,743, Cl. 606-158.000.
Santo, Philip J. Device for reducing wave motion in a waterbed mattress. 4,961,237, Cl. 5-450.000.
Sargent & Greenleaf, Inc.: *See*—
Evans, Walter R., 4,961,330, Cl. 292-21.000.
Sarre, Olga: *See*—
Mallams, Alan K.; Rossman, Randall R.; Sarre, Olga; Girijavallabhan, Viyyoor M.; and Ganguly, Ashit K., 4,962,146, Cl. 514-30.000.
Sartorelli, Alan C.; Shyam, Krishnamurthy; and Hrubiec, Robert T., to Yale University. 1-alkyl-1-sulfonyl-2-alkoxycarbonylsulfenylhydrazines having antineoplastic activity. 4,962,114, Cl. 514-311.000.
Sartori, Guido: *See*—
Ho, W. S. Winston; Sartori, Guido; and Stogryn, Eugene L., 4,961,873, Cl. 252-189.000.
Sasagawa, Souichi, to Yamaha Hatsudoki Kabushiki Kaishi. Trim adjusting device for jet propulsion boat. 4,961,396, Cl. 114-285.000.
Sasaki, Hiroshi: *See*—
Kubota, Tatsuya; Gotanda, Masakazu; Hatta, Shinji; Karasawa, Hitoshi; Kubota, Tetsumaru; Nakamura, Takeaki; Takayama, Syuichi; and Sasaki, Hiroshi, 4,961,424, Cl. 128-24.00A.
Sasaki, Makoto: *See*—
Takeuchi, Kiyohumi; Sasaki, Makoto; and Takatsu, Haruyoshi, 4,961,874, Cl. 252-299.600.
Sase, Akira: *See*—
Doi, Hideaki; Hara, Yasuhiko; Sase, Akira; and Shinada, Satoshi, 4,962,541, Cl. 382-30.000.
Satake, Yoshikatsu; Yamamoto, Shinji; Kaneko, Takashi; Tada, Masahito; Kashiwadate, Ken; Mizuno, Toshiya; Endo, Hiroyuki; Katto, Takayuki; and Shiiki, Zenya, to Kureha Kagaku Kogyo K.K. Poly(arylene thioether) block copolymer fibers and production process thereof. 4,962,143, Cl. 524-100.000.
SatCon Technology Corporation: *See*—
Downer, James R.; Eisenhaure, David B.; Hockney, Richard L.; and Johnson, Bruce G., 4,961,352, Cl. 74-5.460.
Sato, Hitoshi: *See*—
Takatsuto, Suguru; Sato, Hitoshi; and Futatsuya, Fumio, 4,961,775, Cl. 71-88.000.
Sato, Makoto; Takemura, Makoto; Higashi, Kunio; Soga, Tsunehiko; Matsumoto, Hiroo; and Nishi, Toshiyuki, to Daiichi Seiyaku Co., Ltd. Mercapto-bicycloheterocyclics useful as intermediates for penem derivatives. 4,962,202, Cl. 546-112.000.
Sato, Nobuo: *See*—
Enari, Hiroyuki; Kumazawa, Satoru; Shimizu, Susumu; Ito, Atsushi; Sato, Nobuo; and Saishojo, Toshihide, 4,962,278, Cl. 514-399.000.
Sato, Nobuyuki: *See*—
Bando, Masaki; Sukegawa, Kenichi; Yamada, Hiromiti; Masuda, Mitsutsugu; Okada, Yukio; Yukawa, Mitsuyoshi; and Sato, Nobuyuki, 4,961,377, Cl. 101-128.210.
Satoh, Masaharu: *See*—
Fukushima, Naoto; Fukunaga, Yukio; Akatsu, Yohsuke; Fujimura, Itaru; and Satoh, Masaharu, 4,961,595, Cl. 280-772.000.
Satoh, Yayoi, to NEC Corporation. Multi-pulse voice encoder with pitch prediction in a cross-correlation domain. 4,962,536, Cl. 381-49.000.
Sauer, Friedrich: *See*—
Zimmerling, Dieter; Schmidt, Johannes E.; Seubert, Rolf; Fischer, Karl; and Sauer, Friedrich, 4,961,827, Cl. 203-87.000.
Saulay, Frederic: *See*—
Crespin, Jean-Pierre; and Saulay, Frederic, 4,961,442, Cl. 137-312.000.
Savair, Inc.: *See*—
Wolfbauer, Michael H., III, 4,961,317, Cl. 60-560.000.
Savitsky, Wallace R.; Schaffer, Ronald R.; and Warner, Gary N., to AMP Incorporated. Optical fiber termination with crimping body. 4,961,624, Cl. 350-96.200.
Savoni, Eduardo: *See*—
Barnes, Douglas J.; and Savoni, Eduardo, 4,961,949, Cl. 426-518.000.
Sawhney, A. Paul S.; Folk, Craig L.; Robert, Kearny Q.; and Kimmel, Linda B., to United States of America, Agriculture. System for producing staple-wrapped core yarn. 4,961,306, Cl. 57-12.000.
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Donkers, Annemieke C. M.; and Sawicki, George C., 4,961,753, Cl. 8-115.650.
Sawyer, Byron E.: *See*—
Spongr, Jerry J.; and Sawyer, Byron E., 4,962,518, Cl. 378-50.000.
Sawyer, Dennis C., to Mantech Limited. Load pushing apparatus. 4,961,370, Cl. 89-47.000.
Sayles, David C., to United States of America, Army. Hypervelocity penetrator for an electromagnetic accelerator. 4,961,384, Cl. 102-519.000.
Sayo, Noboru: *See*—
Takaya, Hidemasa; Ohta, Tetsuo; Noyori, Ryoji; Sayo, Noboru; Kumobayashi, Hidenori; and Akutagawa, Susumu, 4,962,230, Cl. 562-433.000.
Yamada, Nobuo; Takezawa, Toshiyuki; Sayo, Noboru; Yagi, Misao; Kumobayashi, Hidenori; Akutagawa, Susumu; Takaya, Hidemasa; Inoue, Shinichi; and Noyori, Ryoji, 4,962,242, Cl. 568-822.000.
Sbaschnigg, Johann; and Resch, Franz, to Maschinenfabrik Andritz Actiengesellschaft. Material processing system. 4,961,326, Cl. 68-9.000.
Scappaticci, Karen A.: *See*—
Doogan, Declan P.; Scappaticci, Karen A.; and Hackett, Elizabeth, 4,962,128, Cl. 514-647.000.
Schaap, Arthur P., to Board of Governors of Wayne State University. Chemiluminescent 1,2-dioxetane compounds. 4,962,192, Cl. 536-18.100.
Schaefer, Robert A.: *See*—
Blair, Lawrence W.; and Schaefer, Robert A., 4,961,686, Cl. 416-223.00A.
Schaeffer, Theodore S. Medicament dispenser and medical information storage apparatus. 4,962,491, Cl. 368-21.000.
Schaffer, Ronald R.: *See*—
Savitsky, Wallace R.; Schaffer, Ronald R.; and Warner, Gary N., 4,961,624, Cl. 350-96.200.
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Shands, Jay; Schamell, John; Garde, Gerald; and Carlson, Robert, 4,961,968, Cl. 427-356.000.
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Halvorson, Thomas G.; and Schaub, Herbert R., 4,961,325, Cl. 62-48.100.
Schauder, Colin D., to Westinghouse Electric Corp. Pole-tying current control apparatus. 4,962,339, Cl. 318-798.000.
Scheller, Bernfrid: *See*—
Kresse, Franz; Osberghaus, Rainer; Scheller, Bernfrid; Schunter, Roland; and Tuchermann, Herta, 4,961,242, Cl. 15-228.000.
Schellong, Lieselotte: *See*—
Siedel, Joachim; Schellong, Lieselotte; Staepels, Johnny; Herrmann, Uwe; and Town, Michael-Harold, 4,961,970, Cl. 436-84.000.
Schering Agrochemicals Ltd.: *See*—
Wright, Philip H., 4,961,440, Cl. 134-167.00R.
Schering Corporation: *See*—
Mallams, Alan K.; Rossman, Randall R.; Sarre, Olga; Girijavallabhan, Viyyoor M.; and Ganguly, Ashit K., 4,962,146, Cl. 514-30.000.
Schermerhorn, Paul M.; Teter, Michael P.; and Vanderwoestine, Robert V., to Corning Incorporated. Method for producing ultra-high purity, optical quality, glass articles. 4,961,767, Cl. 65-2.000.
Scheuneman, James H.: *See*—
Byers, Larry L.; Scheuneman, James H.; and Desubijana, Joseba M., 4,962,501, Cl. 371-51.100.
Schipper, Paul H.: *See*—
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,961,907, Cl. 422-144.000.
Schlemmer, Gerhard C. U.; Tamm, Rolf; and Roedel, Günther, to Bodenseewerk Perkin-Elmer GmbH. Electrothermal atomization furnace. 4,961,645, Cl. 356-312.000.
Schlesinger, Artie. Computer security system having remote location recognition and remote location lock-out. 4,962,449, Cl. 364-200.000.
Schlumberger Industries: *See*—
Rose, Rene , 4,961,893, Cl. 264-247.000.
Schlumberger Technology Corporation: *See*—
Rytlewski, Gary L., 4,961,365, Cl. 89-1.150.

Schmidt, Johannes E.: *See—*
Zimmerling, Dieter; Schmidt, Johannes E.; Seubert, Rolf; Fischer, Karl; and Sauer, Friedrich, 4,961,827, Cl. 203-87.000.

Schoeff, John A. Low voltage non-saturating logic circuit technology. 4,962,341, Cl. 307-200.100.

Schoen, William R.: *See—*
Parsons, William H.; Schoen, William R.; and Patchett, ARthur A., 4,962,097, Cl. 514-114.000.

Schonfelder, Ralf: *See—*
Hennecke, Udo; and Schonfelder, Ralf, 4,962,310, Cl. 250-494.100.

Schorr, Theodore H., to Spectra-Physics, Inc. Mounting arrangement for vertically mounting a scanner. 4,962,305, Cl. 250-239.000.

Schrammen, Peter, to WECO Industrietechnik GmbH. Method of and apparatuses for eliminating backlash influence when measuring or setting motor vehicle front wheel track. 4,961,340, Cl. 73-118.100.

Schrammli, Fortunat; Berner, Markus; and Ott, Hans, to Gretag Aktiengesellschaft. Manual device for the detection of optical reflection properties. 4,961,646, Cl. 356-328.000.

Schreiber, Alexander R. Closure for a bottle. 4,961,515, Cl. 222-48.000.

Schreiber, Christopher M., to Hughes Aircraft Company. Method of forming an interconnection by an excimer laser. 4,961,259, Cl. 29-852.000.

Schreiber, Martina: *See—*
Poisel, Hans; Schreiber, Martina; and Trommer, Gerd, 4,962,311, Cl. 250-216.000.

Schroff GmbH: *See—*
Schwenk, Hans M.; Gunther, Hans-Ulrich; and Joist, Michael, 4,961,712, Cl. 439-436.000.

Schryver, Brian B.: *See—*
Eppstein, Deborah A.; and Schryver, Brian B., 4,962,091, Cl. 514-2.000.

Schucker, Robert C.: *See—*
Black, Laura E.; and Schucker, Robert C., 4,962,271, Cl. 585-819.000.
Feimer, Joseph L.; Schucker, Robert C.; and Darnell, Charles P., 4,962,270, Cl. 585-819.000.

Schult, Leslie H.; and Tekautz, Charles J., Jr., to Tartan Transportation Systems, Inc. Air suspension apparatus. 4,961,564, Cl. 267-64.220.

Schulte, Thomas H., to Becton, Dickinson and Company. Signal enhancement in assay for an enzyme. 4,962,024, Cl. 435-14.000.

Schultz, Mark A., to RCA Licensing Corporation. Chroma overload detector using a differential amplifier. 4,962,417, Cl. 358-27.000.

Schulz, Douglas K.; and Meyers, Karl F. Siphon gravity classifier and clarifier. 4,961,842, Cl. 209-155.000.

Schulz, Peter; and Vaupel, Knut, to Bergwerksverband GmbH. Fluidized bed reactor having a housing case from steel. 4,961,705, Cl. 432-58.000.

Schunter, Roland: *See—*
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Schuurmans, Marinus E., to British United Shoe Machinery Ltd. Backpart moulding and heel seat lasting machine. 4,961,240, Cl. 12-12.500.

Schwabische Huttenwerke GmbH: *See—*
Metzler, Horst; and Schwarz, Gunther, 4,961,791, Cl. 148-2.000.

Schwartz, Willis T.: *See—*
Cocoman, Mary K.; and Schwartz, Willis T., 4,962,206, Cl. 549-246.000.

Schwarz, Gunther: *See—*
Metzler, Horst; and Schwarz, Gunther, 4,961,791, Cl. 148-2.000.

Schwarzbich, Jorg. Ball catch for releasably retaining a grooved shaft. 4,961,650, Cl. 384-49.000.

Schwee, Leonard J., to United States of America, Navy. Enhanced crossite random access memory element and a process for the fabrication thereof. 4,962,477, Cl. 365-87.000.

Schwenk, Hans M.; Gunther, Hans-Ulrich; and Joist, Michael, to Schroff GmbH. Mechanical and electrical connection between in extruded metal profile and a cast metal member. 4,961,712, Cl. 439-436.000.

Schwierz, Guenter; and Kestler, Joachim, to Siemens Aktiengesellschaft. Computer tomography apparatus which avoids image artifacts caused by periodical voltage variations. 4,962,513, Cl. 378-12.000.

SCI Systems, Inc.: *See—*
Fulton, Alfred L.; Smallwood, William L.; and Feemster, James A., 4,962,393, Cl. 346-150.000.

Scripps Clinic and Research Foundation: *See—*
Cuervo, Julio H.; and Houghten, Richard A., 4,962,277, Cl. 514-14.000.
Kajiji, Shama; and Quaranta, Vito, 4,962,048, Cl. 436-548.000.

Season-all Industries, Inc.: *See—*
Bezubic, William P., 4,961,286, Cl. 49-175.000.

SEB, S.A.: *See—*
Duborper, Alain; Miquelot, Gilles; Rivier, Paul; and Rosset, Roger, 4,962,299, Cl. 219-492.000.

Seegers, Armin G.: *See—*
De Fockert, Gijsbert; and Seegers, Armin G., 4,961,697, Cl. 425-327.000.

Segal, Leon; and Bar-Or, Jonathan. Slide projector with ergonomic slide selection and access. 4,961,641, Cl. 353-27.00R.

Seiko Epson Corporation: *See—*
Igarashi, Hitoshi, 4,961,659, Cl. 400-693.000.
Kitahara, Tsuyoshi; Yonekubo, Shuji; Morozumi, Hideki; Higashimura, Koichi; and Matsuzawa, Masanao, 4,962,391, Cl. 346-140.00R.
Onodera, Kenji; and Ohkawa, Masami, 4,961,376, Cl. 101-93.140.

Seiko Instruments & Electronics Ltd.: *See—*
Hirano, Shinichi; Toyokuni, Ryo; and Kuroda, Hiroshi, 4,961,823, Cl. 156-623.00R.

Seiko Instruments Inc.: *See—*
Hirane, Hideo; Tanno, Kiyohiko; Yagi, Kentaro; and Iitsuka, Hisao, 4,962,375, Cl. 340-782.000.
Koga, Toshiyuki, 4,962,517, Cl. 378-48.000.
Ooumi, Manabu; Sakuhara, Toshihiko; and Ataka, Tatsuaki, 4,962,480, Cl. 365-151.000.

Seikosha Co., Ltd.: *See—*
Matsushima, Akira, 4,962,433, Cl. 358-335.000.

Seiler, Erhard: *See—*
Taubitz, Christof; Seiler, Erhard; Boehlke, Klaus; and Lausberg, Dietrich, 4,962,157, Cl. 525-132.000.

Seitz, Friedrich: *See—*
Aldag, Reinhard; Neumann, Peter; Boettcher, Andreas; Bluemel, Thomas; and Seitz, Friedrich, 4,962,011, Cl. 430-281.000.

Seki, Masaki; Takegahara, Takashi; and Yamaki, Katsunobu, to Fanuc Ltd. Automatic programming method for outputting figure elements of parts as well as part profile descriptions in response to a part profile request. 4,962,472, Cl. 364-900.000.

Seki, Mitsuhiro, to Somar Corporation. Thin-film releasing apparatus. 4,961,817, Cl. 156-584.000.

Sekimoto, Mutsumi: *See—*
Asano, Masao; Matsuzawa, Yumi; Sekimoto, Mutsumi; Koshizuka, Kunihiro; Teruka, Toshiaki; and Abe, Takao, 4,961,997, Cl. 428-423.100.

Sekino, Hitoshi: *See—*
Matuura, Kazuo; Sekino, Hitoshi; Nishiguchi, Keizo; and Yoshida, Narutaka, 4,962,312, Cl. 250-236.000.

Semi-Conductor Devices, a Tadiran-Rafael Partnership: *See—*
Mainzer, Nili; Weiss, Eliezer; and Carmiel, Leah, 4,961,829, Cl. 204-34.500.

Senkalski, Robert E.; and Hasenmayer, Donald L., to National Starch and Chemical Investment Holding Corporation. Dielectric composition having controlled thermal expansion. 4,961,998, Cl. 428-426.000.

Sennema, Ronald T., to AT&T Bell Laboratories. Switching system for switching packet oriented data as well as circuit oriented data. 4,962,499, Cl. 370-94.100.

Separation Dynamics, Inc.: *See—*
Taylor, John A., 4,961,759, Cl. 55-16.000.

Serco Corporation, The: *See—*
Alexander, James C., 4,961,241, Cl. 14-69.500.

Serkes, Jonathan M.; and Foschaar, William L., to In Vitro Scientific Products. Roller bottle method of culturing cells. 4,962,033, Cl. 435-240.243.

Serowski, Andrew: *See—*
Bodicky, Raymond O.; Crouther, Ronald; Forney, LeRoy S.; and Serowski, Andrew, 4,961,731, Cl. 604-264.000.

Servo-Tek Products Company, Inc.: *See—*
Smith, Charles S., 4,962,331, Cl. 310-261.000.

Seshan, Krishna: *See—*
Beckham, Keith F.; Challener, David C.; Gupta, Arunava; Harvilchuck, Joseph M.; Leas, James M.; Lloyd, James R.; Long, David C.; Quinones, Horatio; Seshan, Krishna; and Shatzkes, Morris, 4,962,294, Cl. 219-121.680.

Sestanj, Kazimir: *See—*
Wrobel, Jay E.; Bauman, John G.; and Sestanj, Kazimir, 4,962,224, Cl. 560-28.000.

Seubert, Rolf: *See—*
Zimmerling, Dieter; Schmidt, Johannes E.; Seubert, Rolf; Fischer, Karl; and Sauer, Friedrich, 4,961,827, Cl. 203-87.000.

Sexton, William F., Jr., to Littelfuse, Inc. Surface mountable leadless fuse. 4,962,363, Cl. 337-186.000.

SGS-Thomson Microelectronics, Inc.: *See—*
Liou, Fu-Tai; Miller, Robert O.; Farohani, Mohammed M.; and Han, Yu-Pin, 4,962,414, Cl. 357-71.000.

SGS-Thomson Microelectronics, S.p.A.: *See—*
Maggioni, Giampietro; Marchio, Fabio; Morelli, Marco; and Tricoli, Francesco, 4,962,346, Cl. 307-270.000.

Shagun, Vladimir A.; Domrachev, Vladimir A.; Balykin, Pavel S.; Sokolov, Jury V.; Lisitsyn, Vitaly E.; and Petrakov, Vladimir P. Apparatus for applying film coatings onto substrates in vacuum. 4,961,832, Cl. 204-298.070.

Shah, Rajiv R.: *See—*
Spratt, David; and Shah, Rajiv R., 4,962,053, Cl. 437-31.000.

Shahidi, Ferrydon; and Shahidi, Joan. Fibre optic waveguide illuminating element. 4,961,617, Cl. 350-96.100.

Shahidi, Joan: *See—*
Shahidi, Ferrydon; and Shahidi, Joan, 4,961,617, Cl. 350-96.100.

Shaked, Ze'ev: *See—*
Hershenson, Susan; Shaked, Ze'ev; and Thomson, Jody, 4,961,969, Cl. 435-69.510.

Shands, Jay; Schamell, John; Garde, Gerald; and Carlson, Robert, to Beloit Corporation. Short dwell coater apparatus with backing blanket disposed between blade and guide roll. 4,961,968, Cl. 427-356.000.

Shanelec, Dennis A. Surfboard construction. 4,961,715, Cl. 441-74.000.

Sharaby, Zaev, to B. F. Goodrich Company, The. Reactive polyvinyl chloride and polymer products made therefrom. 4,962,159, Cl. 525-386.000.

Sharp, Alick M.: *See—*
Barnes, David; and Sharp, Alick M., 4,961,581, Cl. 273-236.000.

Sharp Kabushiki Kaisha: *See—*
Fujioka, Yosihide; Kanatani, Yoshiharu; Ohba, Toshihiro; and Uede, Hisashi, 4,962,374, Cl. 340-781.000.
Ibuchi, Yoshiaki, 4,962,402, Cl. 355-27.000.

Iwai, Hiroji, 4,961,660, Cl. 400-697.100.
Kato, Hiroaki, 4,961,629, Cl. 350-332.000.
Kiuchi, Akihiro, 4,962,512, Cl. 377-78.000.
Masuda, Jitsuo; Morimoto, Junji; Yamagishi, Ken; Kinashi, Hiroshi; Kawabata, Itaru; and Noguchi, Teruhiko, 4,962,408, Cl. 355-245.000.
Morimoto, Mituaki, 4,961,962, Cl. 427-180.000.
Saito, Keizo; and Watanabe, Masanobu, 4,962,465, Cl. 364-518.000.

Shatzkes, Morris: *See*—
Beckham, Keith F.; Challener, David C.; Gupta, Arunava; Harvilchuck, Joseph M.; Leas, James M.; Lloyd, James R.; Long, David C.; Quinones, Horatio; Seshan, Krishna; and Shatzkes, Morris, 4,962,294, Cl. 219-121.680.

Sheahon, John. Cervical biopsy instrument. 4,961,430, Cl. 128-754.000.

Sheets, John W.: *See*—
Goldberg, Eugene P.; Burns, James W.; Kumar, G. Sudesh; Osborn, David C.; Larson, Jeffrey A.; Sheets, John W.; Yahiaoui, Ali; and Robinson, Richard, 4,961,954, Cl. 427-2.000.

Sheffield, Lance R., to Sandpiper Computer & Model Services Limited. Baseboards for use as playboards and/or displays. 4,961,299, Cl. 52-806.000.

Shell Oil Company: *See*—
Corley, Larry S., 4,962,179, Cl. 528-90.000.
Fried, Herbert Elliott, 4,962,226, Cl. 560-205.000.
Hamilton, David M., Jr.; and Kemp, Richard A., 4,962,263, Cl. 585-646.000.
Slaugh, Lynn H., 4,962,267, Cl. 585-670.000.
Smutny, Edgar J., 4,962,184, Cl. 528-392.000.
Van Den Akker, Hendrikus E. A.; Everts, Rudi; Woudstra, Jouke J.; Barnes, Peter H.; Verheul, Cornelis M.; and Dirkse, Hendrik A., 4,961,863, Cl. 210-788.000.

Shen, Lewis N.: *See*—
Sliwa, Jack; Farnaam, Mohammad; Dixit, Pankaj; and Shen, Lewis N., 4,962,060, Cl. 437-192.000.

Sheng, Zhengzhi: *See*—
Hermann, Allen M.; and Sheng, Zhengzhi, 4,962,083, Cl. 505-1.000.

Shepard, Howard S.: *See*—
Crumpler, Michael G.; Barker, George W., III; Smith, Darrell L.; Posey, Willard W.; Shepard, Howard S.; and Campbell, Steven R., 4,961,887, Cl. 264-40.400.

Shera, E. Brooks: *See*—
Jett, James H.; Keller, Richard A.; Martin, John C.; Moyzis, Robert K.; Ratliff, Robert L.; Shera, E. Brooks; and Stewart, Carleton C., 4,962,037, Cl. 435-6.000.

Sherer, Douglas H.; and Mills, Fred M. Golf bag container. 4,961,497, Cl. 206-315.400.

Sherwood Medical Company: *See*—
Bodicky, Raymond O.; Crouther, Ronald; Forney, LeRoy S.; and Serowski, Andrew, 4,961,731, Cl. 604-264.000.

Sheryll, Richard: *See*—
Teller, David M.; Sheryll, Richard; and Ong, Lance, 4,961,533, Cl. 177-25.190.

Shibanaka, Mitsugu, to Mita Industrial Co. Ltd. Sorting apparatus. 4,961,567, Cl. 271-293.000.

Shibata, Kazuyoshi: *See*—
Kawae, Takayuki; and Shibata, Kazuyoshi, 4,961,957, Cl. 427-125.000.

Shibata, Yoshinori: *See*—
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Shibuya, Masaki: *See*—
Yamada, Senichi; Towata, Shinichi; Ikuno, Hajime; Yamamura, Takemi; Ishikawa, Toshihiro; and Shibuya, Masaki, 4,961,990, Cl. 428-240.000.

Shibuya, Mutsumi: *See*—
Nagase, Moriharu; Shibuya, Mutsumi; Asami, Kuniaki; Matsumoto, Katsuo; Teranishi, Hikaru; and Saito, Sukeo, 4,962,043, Cl. 436-165.000.

Shigematsu, Toshifumi: *See*—
Ikenaga, Takao; Shigematsu, Toshifumi; Kusumoto, Akio; Yamamoto, Kimiyoshi; and Yada, Masatoshi, 4,961,431, Cl. 128-760.000.

Shihabi, David S.: *See*—
Absil, Robert P. L.; Han, Scott; Marler, David O.; and Shihabi, David S., 4,962,257, Cl. 585-475.000.
Green, Gary J.; and Shihabi, David S., 4,962,075, Cl. 502-71.000.

Shiigi, Masahiro: *See*—
Yamamoto, Junichi; Tohyama, Yoshio; and Shiigi, Masahiro, 4,962,387, Cl. 346-76.0PH.

Shiiki, Zenya: *See*—
Satake, Yoshikatsu; Yamamoto, Shinji; Kaneko, Takashi; Tada, Masahito; Kashiwadate, Ken; Mizuno, Toshiya; Endo, Hiroyuki; Katto, Takayuki; and Shiiki, Zenya, 4,962,143, Cl. 524-100.000.

Shikata, Shin-ichi, to Sumitomo Electric Industries, Ltd. Method for manufacturing a field effect transistor using spacers of different thicknesses. 4,962,054, Cl. 437-40.000.

Shikata, Shitsuw: *See*—
Kawai, Shuji; Oshino, Kazushi; Okoshi, Hiromi; Mori, Hajime; Ozaki, Katsuya; Shikata, Shitsuw; Ito, Susumu; and Okamoto, Kikuhiko, 4,962,030, Cl. 435-209.000.

Shim, Joosup: *See*—
Le, Quang N.; Marler, David O.; McWilliams, John P.; Rubin, Mae K.; Shim, Joosup; and Wong, Stephen S., 4,962,256, Cl. 585-467.000.

Shimadzu Corporation: *See*—
Soezima, Hiroyoshi, 4,962,516, Cl. 378-45.000.

Shimizu, Akira: *See*—
Leder, Philip; Shimizu, Akira; Siraganian, Reuben; and Benfey, Philip, 4,962,035, Cl. 435-320.000.

Shimizu, Goro; Kamada, Masayasu; and Hayashi, Yoshimi, to Matsui Shikiso Chemical Co., Ltd., a part interest. Process for producing linear material. 4,961,972, Cl. 427-388.100.

Shimizu, Hirofumi; and Morishita, Ken, to Dow Corning K.K. Solid silicone defoamer. 4,961,877, Cl. 252-358.000.

Shimizu, Mitsuru: *See*—
Okada, Yoshio; Imada, Sadao; and Shimizu, Mitsuru, 4,962,320, Cl. 361-56.000.

Shimizu, Susumu: *See*—
Enari, Hiroyuki; Kumazawa, Satoru; Shimizu, Susumu; Ito, Atsushi; Sato, Nobuo; and Saishojo, Toshihide, 4,962,278, Cl. 514-399.000.

Shimizu, Teruo: *See*—
Mihara, Hirokata; Takagi, Koichi; Shimizu, Teruo; Tashiro, Katsunori; and Takahashi, Hideo, 4,961,300, Cl. 53-340.000.

Shimizu, Yasuhiro, to Toshin Technical Co., Ltd. Method of cracking for egg shell. 4,961,946, Cl. 426-299.000.

Shimomura, Akihiro: *See*—
Washizu, Shintaro; Yamaguchi, Jun; Shinozaki, Fumiaki; Shimomura, Akihiro; Usami, Toshimasa; Endo, Toshiaki; and Saeki, Keiso, 4,962,009, Cl. 430-138.000.

Shimono, Toshihide: *See*—
Kinoshita, Mitsuo; Shimono, Toshihide; Yamaguchi, Shozo; and Yamamoto, Tsuneo, 4,962,173, Cl. 526-240.000.

Shimura, Kazuhiro: *See*—
Uehara, Masafumi; Nogami, Akira; Shimura, Kazuhiro; Yumiki, Keiichi; and Iwaki, Akio, 4,961,859, Cl. 210-725.000.

Shimura, Kazuo: *See*—
Takeo, Hideya; and Shimura, Kazuo, 4,962,539, Cl. 382-9.000.

Shin-Etsu Chemical Co., Ltd.: *See*—
Katayama, Seizi; and Kanbara, Hiroshi, 4,962,217, Cl. 556-429.000.

Shinada, Satoshi: *See*—
Doi, Hideaki; Hara, Yasuhiko; Sase, Akira; and Shinada, Satoshi, 4,962,541, Cl. 382-30.000.

Shinagawa, Keisuke; Fujimura, Shuzo; and Hikazutani, Kenichi, to Fujitsu Limited. Ashing method for removing an organic film on a substance of a semiconductor device under fabrication. 4,961,820, Cl. 156-643.000.

Shinjo, Masayoshi; Okamoto, Sumiko; Katakura, Yasuko; and Takubo, Seiji, to Daikin Industries, Ltd. Water- and oil-repellent composition. 4,962,156, Cl. 525-100.000.

Shinko Denki Kabishiki Kaisha: *See*—
Okuno, Takeshi; and Ishiyama, Kiyoshige, 4,962,392, Cl. 346-145.000.

Shinohara, Mahito; Sugawa, Shigetoshi; Hashimoto, Seiji; and Miyawaki, Mamoru, to Canon Kabushiki Kaisha. Photoelectric conversion apparatus without isolation regions. 4,962,412, Cl. 357-30.000.

Shinozaki, Fumiaki: *See*—
Washizu, Shintaro; Yamaguchi, Jun; Shinozaki, Fumiaki; Shimomura, Akihiro; Usami, Toshimasa; Endo, Toshiaki; and Saeki, Keiso, 4,962,009, Cl. 430-138.000.

Shioyama, Tod K.: *See*—
Roberts, John S.; and Shioyama, Tod K., 4,962,169, Cl. 526-209.000.

Shirae, Hideyuki: *See*—
Yokozeki, Kenzo; Shirae, Hideyuki; Shiragami, Hiroshi; Irie, Yasuo; Yasuda, Naohiko; Otani, Masaru; and Tanabe, Toshiya, 4,962,193, Cl. 536-24.000.

Shiragami, Hiroshi: *See*—
Yokozeki, Kenzo; Shirae, Hideyuki; Shiragami, Hiroshi; Irie, Yasuo; Yasuda, Naohiko; Otani, Masaru; and Tanabe, Toshiya, 4,962,193, Cl. 536-24.000.

Shirahata, Kunikatsu: *See*—
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Nagase, Moriharu; Shibuya, Mutsumi; Asami, Kuniaki; Matsumoto, Katsuo; Teranishi, Hikaru; and Saito, Sukeo, 4,962,043, Cl. 436-165.000.

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them and their use in therapeutics and cosmetics. 4,961,922, Cl. 424-70.000.
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Shyu, Jieh-Hwa, to Digital Equipment Corporation. Method of inhibiting electrochemical reduction of polyimide during electroplating and articles formed thereby. 4,962,004, Cl. 428-626.000.
Siciliano, Anthony A., to Evaporating Apparel Industries. Method for draining and drying body fluids. 4,961,735, Cl. 604-378.000.
Siebert, Lester D., to Com-Pac International, Inc. A method for severing and sealing sections of material. 4,961,805, Cl. 156-251.000.
Siecor Corporation: *See*—
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Siegel, Hardo: *See*—
Paul, Axel; Tonne, Peter; Roske, Eckhard; and Siegel, Hardo, 4,962,231, Cl. 562-575.000.
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Nikias, Chrysostomos L.; Brooks, Dana H.; Siegel, John H.; and Fabian, Miklos, 4,961,428, Cl. 128-699.000.
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Siemens Medical Systems, Inc.: *See*—
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Siemens Transmission Systems, Inc.: *See*—
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Sienkiewicz, Krzysztof: *See*—
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Simopoulos, Nicholas T.; and Simopoulos, George N., to Lumel, Inc. Electroluminescent lamps and phosphors. 4,961,956, Cl. 427-70.000.
Simoyama, Yoshirou; Nakajima, Toyohei; Tanaka, Nobuyuki; and Miyake, Tetsuya, to Honda Giken Kogyo Kabushiki Kaisha. Variable displacement type compressor. 4,961,690, Cl. 417-222.000.
Simper, Joyce. Nail polish container having a moveable brush. 4,961,664, Cl. 401-127.000.
Simplex S. A.: *See*—
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Simplimatic Engineering Company: *See*—
Wiseman, John A.; and Murphy, James F., 4,961,492, Cl. 198-841.000.
Simpson, Danny, to Lear Siegler Commercial Products Corp. Closet ironing table. 4,961,388, Cl. 108-42.000.
Sinclair, Richard G., to Drackett Company, The. Calcium hypochlorite tablets. 4,961,872, Cl. 252-186.370.
Singer, Norman S.; Latella, Joseph; and Shoji, Yamamoto, to John Labatt Limited/John Labatt Limitee. Fat emulating protein products and process. 4,961,953, Cl. 426-656.000.
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Siraganian, Reuben: *See*—
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Skene, John M.; Thierheimer, Charles L., Jr.; and Hindagolla, Suraj L., to Hewlett-Packard Company. Smear resistant inks for thermal ink-jet printers. 4,961,785, Cl. 106-22.000.
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Skibik, John. Chaise lounge misting device. 4,961,535, Cl. 239-289.000.
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Slaugh, Lynn H., to Shell Oil Company. Double bond isomerization process. 4,962,267, Cl. 585-670.000.
Slininger, Patricia J.; Vancauwenberge, James E.; and Bothast, Rodney J., to United States of America, Agriculture. Production of 3-hydroxypropionaldehyde from glycerol by *Klebsiella pneumoniae*. 4,962,027, Cl. 435-147.000.
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Gabrilove, Janice L., 4,961,926, Cl. 424-85.100.
Slusar, Brian L.: *See*—
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Smith, David A. Mounting arrangement for a marine radio distress beacon. 4,961,714, Cl. 441-10.000.
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Smith, Gaylord D.: *See*—
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deBarbadillo, John J., II; and Smith, Gaylord D., 4,962,085, Cl. 505-1.000.
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Smith, Lowell R., to Monsanto Company. Process for the preparation of 2-(2-furyl)ethanol amine. 4,962,212, Cl. 549-491.000.
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Smorada, Ronald L.; and Logan, George W., to Reemay, Inc. Printable paper substitute based on spunbonded polypropylene fabrics. 4,961,983, Cl. 428-121.000.
Smowton, Mark, to Ford Motor Company. Fastener. 4,961,554, Cl. 248-68.100.
Smutny, Edgar J., to Shell Oil Company. Polyketone polymer useful in chromatography. 4,962,184, Cl. 528-392.000.
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Societa' Cavi Pirelli S.p.A.: *See*—
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Societe Anonyme dite: STEIN INDUSTRIE: *See—*
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Societe Nationale Elf Aquitaine: *See—*
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Sonnenschein, Armin K. Deuterium lamp voltage supply means. 4,962,335, Cl. 315-335.000.
Sony Corporation: *See—*
Hanagami, Teruyasu; Hino, Michihiro; Nakajima, Takeshi; and Hori, Shoichi, 4,962,467, Cl. 364-519.000.
Sorg, James D.; and Reed, James R., to Sorg, James D. Disposable camera with collapsible bellows. 4,962,398, Cl. 354-86.000.
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Sosa, Hector M. Portable drafting tools hanger. 4,961,556, Cl. 248-314.000.
Sotak, Christopher H. Two-dimensional method for spectral editing of NMR signals produced by metabolites containing coupled spins. 4,962,357, Cl. 324-309.000.
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Spirac Engineering AB: *See—*
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Spongr, Jerry J.; and Sawyer, Byron E., to Twin City International, Inc. Apparatus for measuring the thickness of a coating. 4,962,518, Cl. 378-50.000.
Spraggins, Thomas A.; and Owens, Steven F., to Siemens Medical Systems, Inc. Method for retrospectively gating NMR data. 4,961,426, Cl. 128-653.00A.
Spratt, David; and Shah, Rajiv R., to Texas Instruments Incorporated. Bipolar transistor fabrication utilizing CMOS techniques. 4,962,053, Cl. 437-31.000.
Sprecker, Mark A.; Belko, Robert P.; Brucato, Salvatore M.; Beck, Charles E. J.; and Hanna, Marie R., to International Flavors & Fragrances Inc. 2,4-disubstituted and 2,2,4-trisubstituted tetrahydropyranyl-4-ethers, process for preparing same and perfumery uses thereof. 4,962,090, Cl. 512-9.000.
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Stapelbroek, Maryn G.; Petroff, Michael D.; and Bharat, Ramasesha, to Rockwell International Corporation. Intrinsic impurity band conduction detectors. 4,962,304, Cl. 250-211.00J.
Starz, Karl-Anton; Metzner, Mathias; and Weber, Wolfgang, to Degussa Aktiengesellschaft. Solder paste for fastening semiconductors onto ceramic bases. 4,962,066, Cl. 501-19.000.
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Stypulkowski, Paul H. Array of recessed radially oriented bipolar electrodes. 4,961,434, Cl. 128-784.000.
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Suarez, Francis S.; Roberts, James E.; Kamdar, Vinayak P.; Hyatt, James R.; and Lowe, Lloyd A., to INCO Alloys International, Inc. Tundish for ingot pouring. 4,961,563, Cl. 266-229.000.
Sudymont, Walter A.: *See*—
Barbachano, Fernando G. R.; and Sudymont, Walter A., 4,961,851, Cl. 210-321.650.
Suga, Fusao: *See*—
Ono, Haruo; Kinoshita, Satoshi; and Suga, Fusao, 4,962,469, Cl. 364-561.000.
Sugawa, Shigetoshi: *See*—
Shinohara, Mahito; Sugawa, Shigetoshi; Hashimoto, Seiji; and Miyawaki, Mamoru, 4,962,412, Cl. 357-30.000.
Sugaya, Tomio: *See*—
Nemoto, Shigeo; Namikawa, Osamu; Tsuchiya, Kiyomi; Nakajima, Isao; Kikuchi, Yasuo; Sugaya, Tomio; Ogawa, Toshitaka; and Katagiri, Sigenobu, 4,961,704, Cl. 432-8.000.
Sugiyama, Tsukasa: *See*—
Wakikaido, Takahiro; and Sugiyama, Tsukasa, 4,962,404, Cl. 355-51.000.
Suhonen, Christopher H., to Gillette Canada Inc. Stabilized stannous fluoride toothpaste. 4,961,924, Cl. 424-52.000.
Sukegawa, Kenichi: *See*—
Bando, Masaki; Sukegawa, Kenichi; Yamada, Hiromiti; Masuda, Mitsutsugu; Okada, Yukio; Yukawa, Mitsuyoshi; and Sato, Nobuyuki, 4,961,377, Cl. 101-128.210.
Sullivan, Thomas M. Production of ultrastructural ceramics. 4,961,913, Cl. 423-351.000.
Sullivan, Thomas M. Non-porous metal-oxide coated carbonaceous fibers and applications in ceramic matrices. 4,962,070, Cl. 501-95.000.
Sulzer Brothers Limited: *See*—
Frey, Otto; and Koch, Rudolf, 4,961,748, Cl. 623-22.000.
Sulzer, Gerd, to Liebherr-Verzahnteknik GmbH. Machine tool for fine machining the tooth flanks of pretoothed gearwheels. 4,961,289, Cl. 51-105.0GG.
Sumi, Shigeo: *See*—
Hamamura, Fumio; and Sumi, Shigeo, 4,961,803, Cl. 156-238.000.
Sumida, Mamoru: *See*—
Matsumoto, Osamu; Sumida, Mamoru; and Moriguchi, Teruhiko, 4,961,342, Cl. 73-118.100.
Sumitomo Chemical Company, Limited: *See*—
Fukao, Masami; Hibi, Takuo; Ikimi, Kiyoshi; and Suzukamo, Gohfu, 4,962,254, Cl. 585-452.000.
Hagiya, Koji; Suzukamo, Gohfu; Fukao, Masami; and Sakane, Hiroko, 4,962,233, Cl. 562-866.000.
Kadokura, Hidekimi; Harakawa, Masashi; and Nogami, Nagatoshi, 4,961,889, Cl. 264-63.000.
Sumitomo Electric Industries, Ltd.: *See*—
Shikata, Shin-ichi, 4,962,054, Cl. 437-40.000.
Sumitomo Pharmaceuticals Company, Limited: *See*—
Sunagawa, Makoto; Matsumura, Haruki; Inoue, Takaaki; Fukasawa, Masamoto; and Kato, Masuhiro, 4,962,103, Cl. 514-210.000.
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Suncor, Inc.: *See*—
McLaughlin, Patrick D., 4,961,381, Cl. 102-319.000.
Sundholm, Goran. Welded pipe joint. 4,961,598, Cl. 285-94.000.
Sundstrand Corporation: *See*—
Nallenweg, Richard M.; and Lichtfuss, Gerhardt E., 4,961,652, Cl. 384-312.000.
Sunshine, Abraham; and Laska, Eugene M., to Analgesic Associates. Onset-hastened/enhanced antipyretic response. 4,962,124, Cl. 514-568.000.
Sunstrand Corporation: *See*—
Niggemann, Richard E., 4,962,444, Cl. 361-382.000.
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Visser, Age T.; Trendler, Robert C.; and Koeppe, Paul F., 4,962,354, Cl. 323-360.000.
Superior Glass Fibers, Inc.: *See*—
Miller, William R.; and Klink, Jerome P., 4,961,769, Cl. 65-4.400.
Surgical Dynamics, Inc.: *See*—
Ray, Charles D.; and Dickhudt, Eugene A., 4,961,740, Cl. 606-61.000.
Surti, Tyrone N. Endless loop ribbon cassette with ordered storage. 4,961,656, Cl. 400-196.100.
Sutton, Debra S.: *See*—
Sutton, Terry J.; and Sutton, Debra S., 4,961,661, Cl. 401-6.000.
Sutton, Terry J.; and Sutton, Debra S. Extendable fluid applicator. 4,961,661, Cl. 401-6.000.
Suzukamo, Gohfu: *See*—
Fukao, Masami; Hibi, Takuo; Ikimi, Kiyoshi; and Suzukamo, Gohfu, 4,962,254, Cl. 585-452.000.
Hagiya, Koji; Suzukamo, Gohfu; Fukao, Masami; and Sakane, Hiroko, 4,962,233, Cl. 562-866.000.
Suzukawa, Hiroki: *See*—
Yamada, Yuichi; Ayata, Naoki; Suzukawa, Hiroki; and Nogawa, Hideki, 4,962,423, Cl. 358-101.000.
Suzuki, Azuma, to Kabushiki Kaisha Toshiba. Static random access memory device with power down function. 4,962,487, Cl. 365-233.500.
Suzuki, Osamu; and Masuda, Ichiro, to Nippon Thompson Co., Ltd. Crossed roller bearing assembly having an insertion hole. 4,961,653, Cl. 384-447.000.
Suzuki, Tatsuo: *See*—
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Suzuki, Tetsuo: *See*—
Yoshimura, Shigeru; Suzuki, Tetsuo; and Takemura, Makoto, 4,962,390, Cl. 346-140.00R.
Suzuki, Yuzuru: *See*—
Fujita, Masahiko; Shishido, Yuuji; Suzuki, Yuzuru; and Okamoto, Masato, 4,962,329, Cl. 310-208.000.
Svensson, Paul. Method for the vertical manufacture of sandwich structural elements. 4,961,810, Cl. 156-295.000.
Svetanoff, Dale G., to Curran Company, The. Integrity monitoring method and system for shielded enclosures having a fiber optic cable for bidirectional communications between a receiver and transmitter thereof. 4,962,358, Cl. 324-627.000.
Swain, David M.; Needham, Gregory A.; and Fontana, Louis R., to Rockwell International Corporation. Two-axis beam steering apparatus. 4,961,627, Cl. 350-319.000.
Swede Industries, Inc.: *See*—
Peterson, Robert J., 4,961,547, Cl. 242-238.000.
Sweeney, Harold E.: *See*—
Leonard, Donald A.; and Sweeney, Harold E., 4,962,319, Cl. 250-574.000.
Sweeney, John F. Wheel chair transporter. 4,961,477, Cl. 180-219.000.
Swier, Eugene L. Self limiting cable supervisory device. 4,962,372, Cl. 340-640.000.
Sword, John D.; and Pawson, Kenneth, to Massey-Ferguson Services N.V. Vehicle drive lines. 4,961,721, Cl. 475-47.000.
Sylvester, Judith M.: *See*—
Vincent, Gary A.; Sylvester, Judith M.; and Vincent, Harold L., 4,961,959, Cl. 427-48.000.
Synaptics, Inc.: *See*—
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Synder, Keith A.: *See*—
Jones, Alan L.; and Synder, Keith A., 4,962,416, Cl. 357-81.000.
Syntex (U.S.A.) Inc.: *See*—
Eppstein, Deborah A.; and Schryver, Brian B., 4,962,091, Cl. 514-2.000.
Szajewski, Richard P.; Poslusny, Jerrold N.; and Slusarek, Wojciech, to Eastman Kodak Company. Photographic materials containing DIR compounds and process of imaging. 4,962,018, Cl. 430-544.000.
Ta, Paul D., to National Semiconductor Corporation. High speed auto zero comparator. 4,962,323, Cl. 307-350.000.
Tabor, Stanley; and Richardson, Charles C., to President and Fellows of Harvard College. DNA sequencing. 4,962,020, Cl. 435-6.000.
Tabuse, Hidetoshi: *See*—
Daido, Toshihiko; Matsuoka, Hirofumi; and Tabuse, Hidetoshi, 4,961,474, Cl. 180-79.100.
Tada, Katsuhisa, to Mitsubishi Denki Kabushiki Kaisha. Optical semiconductor device. 4,961,616, Cl. 350-96.200.
Tada, Masahito: *See*—
Satake, Yoshikatsu; Yamamoto, Shinji; Kaneko, Takashi; Tada, Masahito; Kashiwadate, Ken; Mizuno, Toshiya; Endo, Hiroyuki; Katto, Takayuki; and Shiiki, Zenya, 4,962,143, Cl. 524-100.000.
Taeger, Tilman: *See*—
Christner, Juergen; Pfleiderer, Ernst; Taeger, Tilman; and Wick, Gertrud, 4,961,750, Cl. 8-94.270.
Takagi, Hiroshi: *See*—
Kobayashi, Shouzo; Takagi, Hiroshi; and Sakabe, Yukio, 4,961,835, Cl. 204-427.000.
Takagi, Kazuhiko, to Brother Kogyo Kabushiki Kaisha. Feed roller release due to carriage movement in a printing apparatus. 4,961,658, Cl. 400-636.100.
Takagi, Koichi: *See*—
Mihara, Hirokata; Takagi, Koichi; Shimizu, Teruo; Tashiro, Katsunori; and Takahashi, Hideo, 4,961,300, Cl. 53-340.000.

Takahara, Hiroaki; and Asanuma, Shigeru, to Hoya Corporation. Apparatus for processing a melted glass stream into a melted glass lump of a predetermined volume. 4,961,773, Cl. 65-174.000.

Takahashi, Hajime: *See*—
Nakamura, Joji; Kubo, Kazuhiro; Ichikawa, Shunji; Takahashi, Hajime; Isozumi, Keisuke; and Yamada, Toyofumi, 4,962,107, Cl. 514-237.500.

Takahashi, Hideo: *See*—
Mihara, Hirokata; Takagi, Koichi; Shimizu, Teruo; Tashiro, Katsunori; and Takahashi, Hideo, 4,961,300, Cl. 53-340.000.

Takahashi, Hironori; Aoshima, Shinichiro; Nakamura, Iakuya; and Tsuchiya, Yutaka, to Hamamatsu Photonics Kabushiki Kaisha. Voltage detector. 4,962,353, Cl. 324-96.000.

Takahashi, Hiroshi: *See*—
Itoh, Hajime; Ohbori, Kouzi; Mitani, Kazutami; Takahashi, Hiroshi; Takehashi, Kouji; and Aoki, Kunihiro, 4,961,853, Cl. 210-500.340.

Takahashi, Katsuji: *See*—
Kitamura, Taku; Kurokawa, Noriko; and Takahashi, Katsuji, 4,962,240, Cl. 568-730.000.

Takahashi, Kenji: *See*—
Tanabe, Haruyoshi; Kawakami, Masahiro; Takahashi, Kenji; Iwasaki, Katsuhiro; and Inoue, Shigeru, 4,961,784, Cl. 75-623.000.

Takahashi, Koichi, to Fuji Photo Film Co., Ltd. Film cartridge. 4,962,401, Cl. 354-275.000.

Takahashi, Nobuyuki: *See*—
Matsumoto, Hisashi; Takami, Masaaki, deceased; Takahashi, Nobuyuki; and Inoue, Tetsuya, 4,962,079, Cl. 503-226.000.
Yamamoto, Takashi; Yoneda, Toshikazu; Katsuno, Hisashi; Murakawa, Takashi; and Takahashi, Nobuyuki, 4,962,251, Cl. 585-419.000.

Takakura, Yoshinari: *See*—
Itakura, Masato; Takakura, Yoshinari; and Tanahashi, Toshio, 4,961,404, Cl. 123-41.310.

Takami, Harumi, legal representative: *See*—
Matsumoto, Hisashi; Takami, Masaaki, deceased; Takahashi, Nobuyuki; and Inoue, Tetsuya, 4,962,079, Cl. 503-226.000.

Takami, Masaaki, deceased: *See*—
Matsumoto, Hisashi; Takami, Masaaki, deceased; Takahashi, Nobuyuki; and Inoue, Tetsuya, 4,962,079, Cl. 503-226.000.

Takano, Akihiko: *See*—
Iida, Katsumi; and Takano, Akihiko, 4,961,462, Cl. 165-12.000.

Takasa, Kenji; and Iijima, Satoshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Biaxially oriented polyoxymethylene film. 4,962,001, Cl. 428-524.000.

Takasago International Corporation: *See*—
Takaya, Hidemasa; Ohta, Tetsuo; Noyori, Ryoji; Sayo, Noboru; Kumobayashi, Hidenori; and Akutagawa, Susumu, 4,962,230, Cl. 562-433.000.

Takasago Perfumery Co., Ltd.: *See*—
Yamada, Nobuo; Takezawa, Toshiyuki; Sayo, Noboru; Yagi, Misao; Kumobayashi, Hidenori; Akutagawa, Susumu; Takaya, Hidemasa; Inoue, Shinichi; and Noyori, Ryoji, 4,962,242, Cl. 568-822.000.

Takashima, Akira, to Kubota, Ltd. Hydraulic circuit for a backhoe. 4,961,371, Cl. 91-530.000.

Takashima, Sumihiro: *See*—
Yamazaki, Seiichi; Inoue, Hiroaki; Takashima, Sumihiro; and Shishikura, Hiroshisa, 4,962,413, Cl. 357-42.000.

Takata, Yoshifumi, to Mitsubishi Denki Kabushiki Kaisha. Method for manufacturing a multilayer wiring structure employing metal fillets at step portions. 4,962,061, Cl. 437-195.000.

Takatani, Muneo: *See*—
Tsushima, Susumu; Takatani, Muneo; and Nishikawa, Kohei, 4,962,113, Cl. 514-307.000.

Takatori, Naoki: *See*—
Kondo, Shigeru; Takatori, Naoki; Morizumi, Masaaki; and Kanamori, Shino, 4,961,635, Cl. 350-429.000.

Takatsu, Haruyoshi: *See*—
Takeuchi, Kiyohumi; Sasaki, Makoto; and Takatsu, Haruyoshi, 4,961,874, Cl. 252-299.600.

Takatsuto, Suguru; Sato, Hitoshi; and Futatsuya, Fumio, to Nippon Kayaku Kabushiki Kaisha; and Tama Biochemical Co., Ltd. Brassinosteroid derivatives and plant growth regulators. 4,961,775, Cl. 71-88.000.

Takaya, Hidemasa; Ohta, Tetsuo; Noyori, Ryoji; Sayo, Noboru; Kumobayashi, Hidenori; and Akutagawa, Susumu, to Takasago International Corporation. Process for producing optically active carboxylic acid. 4,962,230, Cl. 562-433.000.

Takaya, Hidemasa: *See*—
Yamada, Nobuo; Takezawa, Toshiyuki; Sayo, Noboru; Yagi, Misao; Kumobayashi, Hidenori; Akutagawa, Susumu; Takaya, Hidemasa; Inoue, Shinichi; and Noyori, Ryoji, 4,962,242, Cl. 568-822.000.

Takayama, Syuichi: *See*—
Kubota, Tatsuya; Gotanda, Masakazu; Hatta, Shinji; Karasawa, Hitoshi; Kubota, Tetsumaru; Nakamura, Takeaki; Takayama, Syuichi; and Sasaki, Hiroshi, 4,961,424, Cl. 128-24.00A.

Takeda Chemical Industries, Ltd.: *See*—
Miyake, Akio; Kondo, Masahiro; and Fujino, Masahiko, 4,962,100, Cl. 514-202.000.

Takeda Chemical Industries, Ltd: *See*—
Tsushima, Susumu; Takatani, Muneo; and Nishikawa, Kohei, 4,962,113, Cl. 514-307.000.

Takeda, Hiromitsu: *See*—
Masaki, Mitsuo; Takeda, Hiromitsu; Kamishiro, Toshiro; and Yamamoto, Masao, 4,962,096, Cl. 514-92.000.

Takeda, Katunobu: *See*—
Naoi, Nobuaki; Takeda, Katunobu; and Yuki, Ikuo, 4,962,426, Cl. 358-167.000.

Takeda, Kimihito: *See*—
Nogami, Hiroyasu; Miike, Seiji; Takeda, Kimihito; Amano, Shinya; and Aoyama, Chiaki, 4,962,452, Cl. 364-419.000.

Takeda, Shigefumi: *See*—
Matsuoka, Yoshiyuki; Hosaka, Kunio; Takeda, Shigefumi; and Mitsuhashi, Hiroshi, 4,962,211, Cl. 549-436.000.

Takeda, Yasushi, to Kabushiki Kaisha Toshiba. Tab film tape carrier. 4,961,984, Cl. 428-192.000.

Takegahara, Takashi: *See*—
Seki, Masaki; Takegahara, Takashi; and Yamaki, Katsunobu, 4,962,472, Cl. 364-900.000.

Takehashi, Kouji: *See*—
Itoh, Hajime; Ohbori, Kouzi; Mitani, Kazutami; Takahashi, Hiroshi; Takehashi, Kouji; and Aoki, Kunihiro, 4,961,853, Cl. 210-500.340.

Takemoto Yushi Kabushiki Kaisha: *See*—
Kinoshita, Mitsuo; Shimono, Toshihide; Yamaguchi, Shozo; and Yamamoto, Tsuneo, 4,962,173, Cl. 526-240.000.

Takemura, Makoto: *See*—
Sato, Makoto; Takemura, Makoto; Higashi, Kunio; Soga, Tsunehiko; Matsumoto, Hiroo; and Nishi, Toshiyuki, 4,962,202, Cl. 546-112.000.
Yoshimura, Shigeru; Suzuki, Tetsuo; and Takemura, Makoto, 4,962,390, Cl. 346-140.00R.

Takeo, Hideya; and Shimura, Kazuo, to Fuji Photo Film Co., Ltd. Method of recognizing layout and subdivision patterns of radiation images. 4,962,539, Cl. 382-9.000.

Takeshima, Masahiko; and Mitsuishi, Naoki, to Hitachi, Ltd. Nonvolatile memory device. 4,962,484, Cl. 365-226.000.

Takeuchi, Kiyohumi; Sasaki, Makoto; and Takatsu, Haruyoshi, to Dainippon Ink & Chemicals, Inc. Optically active tolan derivatives. 4,961,874, Cl. 252-299.600.

Takeyama, Yoshinobu: *See*—
Imakawa, Susumu; Takeyama, Yoshinobu; Kubo, Nobuaki; and Saitoh, Masanori, 4,962,431, Cl. 358-296.000.

Takezawa, Toshiyuki: *See*—
Yamada, Nobuo; Takezawa, Toshiyuki; Sayo, Noboru; Yagi, Misao; Kumobayashi, Hidenori; Akutagawa, Susumu; Takaya, Hidemasa; Inoue, Shinichi; and Noyori, Ryoji, 4,962,242, Cl. 568-822.000.

Takubo, Seiji: *See*—
Shinjo, Masayoshi; Okamoto, Sumiko; Katakura, Yasuko; and Takubo, Seiji, 4,962,156, Cl. 525-100.000.

Talaski, Edward J.: *See*—
Hoover, Thomas M.; and Talaski, Edward J., 4,961,693, Cl. 417-363.000.

Tam, Wilson: *See*—
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Tama Biochemical Co., Ltd.: *See*—
Takatsuto, Suguru; Sato, Hitoshi; and Futatsuya, Fumio, 4,961,775, Cl. 71-88.000.

Tamerlani, Giancarlo: *See*—
Cannata, Vincenzo; Tamerlani, Giancarlo; and Morotti, Mauro, 4,962,223, Cl. 558-408.000.

Tamm, Rolf: *See*—
Schlemmer, Gerhard C. U.; Tamm, Rolf; and Roedel, Gunther, 4,961,645, Cl. 356-312.000.

Tamura, Yasuyuki: *See*—
Kan, Fumitaka; Tamura, Yasuyuki; Kushida, Naoki; Tohma, Koichi; Fukumoto, Hiroshi; Yuasa, Toshiya; Tohyama, Noboru; and Koizumi, Norihiko, 4,962,389, Cl. 346-140.00R.

Tan, Hiroaki: *See*—
Kihara, Noriaki; Tomino, Ikuo; Tan, Hiroaki; and Ishihara, Takafumi, 4,962,200, Cl. 544-333.000.

Tanabe, Haruyoshi; Kawakami, Masahiro; Takahashi, Kenji; Iwasaki, Katsuhiro; and Inoue, Shigeru, to NKK Corporation. Method of smelting reduction of chromium raw materials and a smelting reduction furnace thereof. 4,961,784, Cl. 75-623.000.

Tanabe, Koji: *See*—
Kojima, Tatsuo; Kobayashi, Tatsunori; Katou, Kouki; Ohba, Tetsuya; Yatsuzuka, Takashi; and Tanabe, Koji, 4,961,261, Cl. 29-895.210.

Tanabe, Toshiya: *See*—
Yokozeki, Kenzo; Shirae, Hideyuki; Shiragami, Hiroshi; Irie, Yasuo; Yasuda, Naohiko; Otani, Masaru; and Tanabe, Toshiya, 4,962,193, Cl. 536-24.000.

Tanahashi, Toshio: *See*—
Itakura, Masato; Takakura, Yoshinari; and Tanahashi, Toshio, 4,961,404, Cl. 123-41.310.

Tanaka, Akiei: *See*—
Kusui, Jun; Tanaka, Akiei; and Kawai, Masahiko, 4,961,779, Cl. 75-231.000.

Tanaka, Masashi; Yamauchi, Shigekazu; and Mikita, Masaru, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Testing device for an oxygen sensor. 4,961,341, Cl. 73-118.100.

Tanaka, Mituru, to NEC Corporation. Radio telephone set used as portable set and vehicle-mounted set. 4,962,523, Cl. 379-58.000.

Tanaka, Nobuyuki: *See*—
Simoyama, Yoshirou; Nakajima, Toyohei; Tanaka, Nobuyuki; and Miyake, Tetsuya, 4,961,690, Cl. 417-222.000.
Tangney, Kathryn R., to Dow Corning Corporation. Fragrance release device containing a highly adsorptive copolymer. 4,961,532, Cl. 239-60.000.
Tanis, Steven W. Flow meter. 4,961,349, Cl. 73-861.520.
Tanno, Kiyohiko: *See*—
Hirane, Hideo; Tanno, Kiyohiko; Yagi, Kentaro; and Iitsuka, Hisao, 4,962,375, Cl. 340-782.000.
Tarascon, Jean-Marie: *See*—
Barboux, Philippe; and Tarascon, Jean-Marie, 4,962,082, Cl. 505-001.000.
Tartan Transportation Systems, Inc.: *See*—
Schult, Leslie H.; and Tekautz, Charles J., Jr., 4,961,564, Cl. 267-64.220.
Tashiro, Katsunori: *See*—
Mihara, Hirokata; Takagi, Koichi; Shimizu, Teruo; Tashiro, Katsunori; and Takahashi, Hideo, 4,961,300, Cl. 53-340.000.
Tatemoto, Masayoshi; Yutani, Yuji; and Fujiwara, Koji, to Daikin Industries Ltd. Novel iodine-containing compound, preparation thereof and block copolymer comprising the same. 4,962,236, Cl. 568-615.000.
Tateoka, Yasuo; Ito, Masashi; Maeda, Shuichi; Mitsuhashi, Kazuo; and Murayama, Tetsuo, to Nissan Motor Co., Ltd. Yokohama; and Mitsubishi Kasei Corporation. Photochromic material containing a spirooxazine and a nitroxy free radical triplet state quencher. 4,962,013, Cl. 430-338.000.
Taubitz, Christof; Seiler, Erhard; Boehlke, Klaus; and Lausberg, Dietrich, to BASF Aktiengesellschaft. Thermoplastics molding materials based on polyphenylene ethers and polyesters. 4,962,157, Cl. 525-132.000.
Tauer, James J.: *See*—
DeMaio, Joseph; Radke, Kathleen M.; and Tauer, James J., 4,962,448, Cl. 364-146.000.
Taylor, James B.: *See*—
Antrim, Richard L.; and Taylor, James B., 4,961,939, Cl. 426-61.000.
Taylor, Jeffrey L., to Standard Textile Company, Inc. Liquid-absorbing pad assembly and method of making same. 4,961,982, Cl. 428-41.000.
Taylor, Jimmy; Singleton, David L.; Skeens, Stanley A.; and Runyon, Dennis R., to Guyan Machinery Co. Conical screen for a vertical centrifugal separator. 4,961,722, Cl. 494-36.000.
Taylor, John A., to Separation Dynamics, Inc. Closed loop gas dehydration process and apparatus. 4,961,759, Cl. 55-16.000.
Taylor, Michael P.: *See*—
Sansone, Ronald P.; Taylor, Michael P.; and Doeberl, Terrence M., 4,962,454, Cl. 364-464.020.
Taylor, Richard L.; Drosd, Ralph D., deceased; and by Gregory, Luther W., administrator, to United States of America, Air Force. Frequency-diversity receiver system. 4,962,534, Cl. 380-34.000.
Tazi, Mohammed; Kwak, Yoon T.; and Piochocka, Krystyna, to GAF Chemicals Corporation. Process of rendering copolymer powders of maleic anhydride and an alkyl vinyl ether prepared in benzene solvent substantially benzene-free. 4,962,185, Cl. 528-497.000.
Teatr Polifonicheskoi Dramy: *See*—
Judenich, Gennady I., 4,962,420, Cl. 358-60.000.
Tekautz, Charles J., Jr.: *See*—
Schult, Leslie H.; and Tekautz, Charles J., Jr., 4,961,564, Cl. 267-64.220.
Tektronix, Inc.: *See*—
Bayard, Michel L., 4,962,071, Cl. 501-134.000.
Meadows, Robert D., 4,962,380, Cl. 341-120.000.
Telefunken electronic GmbH: *See*—
Nutz, Karl-Diether, 4,962,439, Cl. 361-95.000.
Telephone Corporation & Sharp Kabushiki Kaisha: *See*—
Kotani, Matahira; Matsumoto, Masafumi; Fujii, Mamoru; Hayashi, Motohiko; Hachinoda, Masayuki; Kondo, Mitsunobu; Murata, Naomitsu; and Mino, Kouichi, 4,962,526, Cl. 379-100.000.
Teller, David M.; Sheryll, Richard; and Ong, Lance, to Viac Inc. Inventory control system. 4,961,533, Cl. 177-25.190.
Tellier, Thomas A.: *See*—
Drake, Donald J.; Hawkins, William G.; Campanelli, Michael R.; and Tellier, Thomas A., 4,961,821, Cl. 156-647.000.
Tennstedt, Ernst, to Eppendorf-Netheler-Hinz GmbH, Firma. Fittable pipette tip consisting of a vessel which is designed to fit a particularly conical fitting head of a pipette. 4,961,350, Cl. 73-864.010.
Teranishi, Hikaru: *See*—
Nagase, Moriharu; Shibuya, Mutsumi; Asami, Kuniaki; Matsumoto, Katsuo; Teranishi, Hikaru; and Saito, Sukeo, 4,962,043, Cl. 436-165.000.
Terra Marine Engineering, Inc.: *See*—
McDavid, William T.; Bryce, William W.; and Itani, Talal A., 4,962,510, Cl. 375-67.000.
Teter, Michael P.: *See*—
Schermerhorn, Paul M.; Teter, Michael P.; and Vanderwoestine, Robert V., 4,961,767, Cl. 65-2.000.
Texaco Inc.: *See*—
Dobitz, John K., 4,961,758, Cl. 55-16.000.
Hart, Timothy J.; and Davis, Lorne A., Jr., 4,962,514, Cl. 378-18.000.
Reale, John, Jr.; and Bartels, Craig R., 4,961,855, Cl. 210-640.000.
Texas Instrument Incorporated: *See*—
Krueger, Steven D.; Branstad, Martha A.; and Walker, Stephen T., 4,962,533, Cl. 380-25.000.
Texas Instruments Incorporated: *See*—
Chapman, Richard A., 4,962,322, Cl. 307-304.000.
Havemann, Robert H.; and Eklund, Robert H., 4,962,365, Cl. 338-306.000.
Spratt, David; and Shah, Rajiv R., 4,962,053, Cl. 437-31.000.
Textilver, S.A.: *See*—
Archer, Joel; and Van Wassenhove, Denis, 4,961,977, Cl. 428-36.300.
Teyssedre, Alain: *See*—
Butler, David R.; Snow, George; Sandford, Philip; Neu, Max G.; Villani, Jean P.; Teyssedre, Alain; and Lenoir, Roland, 4,961,460, Cl. 164-134.000.
Tezuka, Toshiaki: *See*—
Asano, Masao; Matsuzawa, Yumi; Sekimoto, Mutsumi; Koshizuka, Kunihiro; Tezuka, Toshiaki; and Abe, Takao, 4,961,997, Cl. 428-423.100.
Tgortorice, John A.: *See*—
Bogard, William T.; Bohm, George J.; Ciaramitaro, William; Palusamy, Sam S.; Singleton, Norman R.; and Tgortorice, John A., 4,961,898, Cl. 376-245.000.
Theeuwes, Felix, to Alza Corporation. Plurality of tiny pills in liquid dosage form. 4,961,932, Cl. 424-455.000.
Thermalloy Incorporated: *See*—
Clemens, Donald L., 4,962,442, Cl. 361-403.000.
Thiel, Donald J.: *See*—
Wittmann, John W.; Thiel, Donald J.; and Smith, George W., 4,961,854, Cl. 210-621.000.
Thierheimer, Charles L., Jr.: *See*—
Skene, John M.; Thierheimer, Charles L., Jr.; and Hindagolla, Suraj L., 4,961,785, Cl. 106-22.000.
Thiokol Corporation: *See*—
Moore, R. Gilbert, 4,961,699, Cl. 425-387.100.
Thomas, Eugene R.: *See*—
Wolfe, Ralph G.; Maloney, Dennis P.; Steele, Robert E.; Tsonopoulos, Constantine; and Thomas, Eugene R., 4,962,238, Cl. 568-621.000.
Thomas, Mark A.: *See*—
Wood, Robert B.; Thomas, Mark A.; and Desmond, John P., 4,961,625, Cl. 350-174.000.
Thompson, Barbara J.; Bingham, Russell D.; and Holmes, William, Jr., to Tutor Toys, Inc. Electronic puzzle game. 4,961,579, Cl. 273-153.00R.
Thompson, Donald O.: *See*—
Hsu, David K.; Margetan, Frank J.; Hasselbusch, Michael D.; Wormley, Samuel J.; Hughes, Michael S.; and Thompson, Donald O., 4,961,252, Cl. 29-25.350.
Thompson, Richard K., to Aspen Labatories, Inc. Waveform generator for electrosurgical apparatus. 4,961,739, Cl. 606-37.000.
Thompson, T. Lewis; and Alexander, James V., to Space Biospheres Venture. Indoor air purifier. 4,961,763, Cl. 55-312.000.
Thomson, Jody: *See*—
Hershenson, Susan; Shaked, Ze'ev; and Thomson, Jody, 4,961,969, Cl. 435-69.510.
Thoresson, Hans-Olof: *See*—
Andersson, Kjell R.; Larsson, Bernt; Thoresson, Hans-Olof; and Larsson, Bo V., 4,961,825, Cl. 162-175.000.
Thors, Bengt: *See*—
Johnnerfelt, Bengt; and Thors, Bengt, 4,962,440, Cl. 361-126.000.
Threatt, Raymond W. Chuck for attaching utility vehicle accessories. 4,961,681, Cl. 414-607.000.
Thulin, Robert R.: *See*—
Cocco, Mark V.; Ross, Robert E.; and Thulin, Robert R., 4,961,941, Cl. 426-94.000.
Cocco, Mark V.; Ross, Robert E.; and Thulin, Robert R., 4,961,942, Cl. 426-94.000.
Tiffany, Thomas O.: *See*—
Andersen, Mario R.; Tiffany, Thomas O.; and Gangitano, Mario J., 4,961,906, Cl. 422-102.000.
Tijburg, Ivo I. M.; and Geus, John W., to Engelhard de Meern B. V. Carrier material for a catalyst and a process for making such a carrier material. 4,962,280, Cl. 502-439.000.
Timm, Ronald E., to R. E. Timm & Associates, Inc. Pressure vessel for dispensing materials and method for filling same. 4,961,448, Cl. 141-9.000.
Titus, John D.: *See*—
Bai, Monty W.; Farace, Louis P.; and Titus, John D., 4,961,382, Cl. 102-476.000.
Tkac, Angela. Decorating cakes. 4,961,517, Cl. 222-94.000.
Tlustakova, Marie: *See*—
Cermak, Pavel; Monhart, Vaclav; Horak, Jire,acu/i ; Tlustakova, Marie; and Paroubek, Miroslav, 4,962,036, Cl. 435-34.000.
Toda, Fumio, to Kureha Kagaku Kogyo K.K. Process for separating alkyl-substituted naphthalene derivatives using clathrate complexes. 4,962,274, Cl. 585-833.000.
Todd, George R. Support system for pipes and other loads. 4,961,553, Cl. 248-62.000.
Todd, William J.; and Barstad, Paul A., to Louisiana State University, Agricultural and Mechanical College. Single incubation immuno sorbent assay method using particle labels to detect test antigen specific antibodies in presence of other antibodies. 4,962,023, Cl. 435-7.000.
Todome, Tuyoshi: *See*—
Hiroki, Masashi; Koseki, Junichi; and Todome, Tuyoshi, 4,962,430, Cl. 358-296.000.

Tohma, Koichi: *See—*
Kan, Fumitaka; Tamura, Yasuyuki; Kushida, Naoki; Tohma, Koichi; Fukumoto, Hiroshi; Yuasa, Toshiya; Tohyama, Noboru; and Koizumi, Norihiko, 4,962,389, Cl. 346-140.00R.

Toho Rayon Co., Ltd.: *See—*
Kosuda, Hiroyuki; Nagata, Yasuhisa; and Andoh, Masato, 4,962,162, Cl. 525-422.000.

Tohyama, Noboru: *See—*
Kan, Fumitaka; Tamura, Yasuyuki; Kushida, Naoki; Tohma, Koichi; Fukumoto, Hiroshi; Yuasa, Toshiya; Tohyama, Noboru; and Koizumi, Norihiko, 4,962,389, Cl. 346-140.00R.

Tohyama, Yoshio: *See—*
Yamamoto, Junichi; Tohyama, Yoshio; and Shiigi, Masahiro, 4,962,387, Cl. 346-76.0PH.

Tokai Kogyo Kabushiki Kaisha: *See—*
Unuma, Sadao, 4,961,526, Cl. 226-74.000.

Tokumaru, Takeji, to Kabushiki Kaisha Toshiba. Barrel shifter. 4,962,511, Cl. 377-69.000.

Tokura, Norihito; Kuno, Hironari; Ito, Hiroyasu; Saito, Hirohiko; and Hara, Kunihiko, to Nippondenso Co., Ltd. Semiconductor device with current detecting function. 4,962,411, Cl. 357-23.400.

Toledo Engineering Co., Inc.: *See—*
Duly, Raymond K.; and Flavell, James A., 4,961,772, Cl. 65-134.000.

Tomino, Ikuo: *See—*
Kihara, Noriaki; Tomino, Ikuo; Tan, Hiroaki; and Ishihara, Takafumi, 4,962,200, Cl. 544-333.000.

Tomita, Akira: *See—*
Uken, William D.; and Tomita, Akira, 4,961,620, Cl. 350-96.150.

Tong, Hing Y.; and Lunn, Gerald K., to Motorola, Inc. Multistandard OSD in a TV receiver including display positioning. 4,962,428, Cl. 358-188.000.

Tong, Hing Y.: *See—*
Lunn, Gerald K.; and Tong, Hing Y., 4,962,427, Cl. 358-188.000.

Tonne, Peter: *See—*
Paul, Axel; Tonne, Peter; Roske, Eckhard; and Siegel, Hardo, 4,962,231, Cl. 562-575.000.

Topel, Kenneth D. Restraint alignment assembly for use with a string mounted peepsight. 4,961,264, Cl. 33-265.000.

Toray Industries: *See—*
Kanai, Takashi; Kimura, Michio; and Noguchi, Yoshio, 4,962,245, Cl. 570-211.000.

Toro Company, The: *See—*
Tyler, Stephen L.; and Staylor, John L., 4,961,534, Cl. 239-205.000.

Torre, Randall J. Suture needle holding instrument. 4,961,742, Cl. 606-147.000.

Toshin Technical Co., Ltd.: *See—*
Shimizu, Yasuhiro, 4,961,946, Cl. 426-299.000.

Toto, Ltd.: *See—*
Ikenaga, Takao; Shigematsu, Toshifumi; Kusumoto, Akio; Yamamoto, Kimiyoshi; and Yada, Masatoshi, 4,961,431, Cl. 128-760.000.

Towata, Shinichi: *See—*
Yamada, Senichi; Towata, Shinichi; Ikuno, Hajime; Yamamura, Takemi; Ishikawa, Toshihiro; and Shibuya, Masaki, 4,961,990, Cl. 428-240.000.

Town, Michael-Harold: *See—*
Siedel, Joachim; Schellong, Lieselotte; Staepels, Johnny; Herrmann, Uwe; and Town, Michael-Harold, 4,961,970, Cl. 436-84.000.

Toyo Aluminium Kabushiki Kaisha: *See—*
Kusui, Jun; Tanaka, Akiei; and Kawai, Masahiko, 4,961,779, Cl. 75-231.000.

Toyokuni, Ryo: *See—*
Hirano, Shinichi; Toyokuni, Ryo; and Kuroda, Hiroshi, 4,961,823, Cl. 156-623.00R.

Toyota Jidosha Kabushiki Kaisha: *See—*
Itakura, Masato; Takakura, Yoshinari; and Tanahashi, Toshio, 4,961,404, Cl. 123-41.310.

Tozzolino, Pierre: *See—*
Cabiez, Gerard; and Tozzolino, Pierre, 4,962,215, Cl. 556-45.000.

Trainer, William E.: *See—*
Roberts, Auston K.; Trainer, William E.; Blumenfeld, Mark L.; and Biederman, David L., 4,961,912, Cl. 423-322.000.

Tran, Tam H.: *See—*
Krinski, Thomas L.; Tran, Tam H.; and Gambaro, Jeffrey J., 4,961,788, Cl. 106-154.000.

Transitions Research Corporatioo: *See—*
Pong, William; Engelberger, Joseph F.; Evans, John M.; and Kazman, William S., 4,962,453, Cl. 364-424.020.

Trautmann, Hugh M., to Billco Manufacturing, Inc. Quick-release hub assembly for mounting a wheel element to a shaft. 4,961,668, Cl. 403-351.000.

Treat, David W.: *See—*
Epler, John E.; and Treat, David W., 4,962,057, Cl. 437-81.000.

Trendler, Robert C.: *See—*
Visser, Age T.; Trendler, Robert C.; and Koeppe, Paul F., 4,962,354, Cl. 323-360.000.

Tresselt, Carl P., to Allied-Signal Inc. Low profile array antenna system with independent multibeam control. 4,962,383, Cl. 343-700.0MS.

Treybig, Duane S., to Dow Chemical Company, The. Process for preventing corrosion of metals by contacting them with compositions prepared from amino substituted pyrazines and carboxylic acids carboxylic acid anhydrides, carboxylic acid, esters or carboxylic acid halides. 4,961,867, Cl. 252-8.555.

Tribble, Alice K.; and Tribble, Joe L. Men's underware with penile envelope. 4,961,419, Cl. 128-159.000.

Tribble, Joe L.: *See—*
Tribble, Alice K.; and Tribble, Joe L., 4,961,419, Cl. 128-159.000.

Tricoli, Francesco: *See—*
Maggioni, Giampietro; Marchio, Fabio; Morelli, Marco; and Tricoli, Francesco, 4,962,346, Cl. 307-270.000.

Trimmer, Johnny L.: *See—*
Caskey, Terrence L.; Jorgensen, Janine L.; and Trimmer, Johnny L., 4,961,760, Cl. 35-158.000.

Trommer, Gerd: *See—*
Poisel, Hans; Schreiber, Martina; and Trommer, Gerd, 4,962,311, Cl. 250-216.000.

Trone, Gordon. Challenge craft. 4,961,397, Cl. 114-347.000.

Troxell, Donald L.: *See—*
Peel, Robert C.; and Troxell, Donald L., 4,961,360, Cl. 83-745.000.

Tsonopoulos, Constantine: *See—*
Wolfe, Ralph G.; Maloney, Dennis P.; Steele, Robert E.; Tsonopoulos, Constantine; and Thomas, Eugene R., 4,962,238, Cl. 568-621.000.

Tsuchiya, Kiyomi: *See—*
Nemoto, Shigeo; Namikawa, Osamu; Tsuchiya, Kiyomi; Nakajima, Isao; Kikuchi, Yasuo; Sugaya, Tomio; Ogawa, Toshitaka; and Katagiri, Sigenobu, 4,961,704, Cl. 432-8.000.

Tsuchiya, Yutaka: *See—*
Takahashi, Hironori; Aoshima, Shinichiro; Nakamura, Iakuya; and Tsuchiya, Yutaka, 4,962,353, Cl. 324-96.000.

Tsujino, Yoshio; Yokoo, Yoshiharu; Sakato, Kuniaki; and Hagino, Hiroshi, to Kyowa Hakko Kogyo Co., Ltd. Hair preparation composition. 4,961,925, Cl. 424-71.000.

Tsujiuchi, Junpei; Ikeda, Shigeto; Honda, Toshio; Ohyama, Nagaaki; Badique, Eric; and Kikuchi, Susumu, to Olympus Optical Co., Ltd. Method and apparatus for detecting corresponding regions between picture images. 4,962,540, Cl. 382-17.000.

Tsumura & Co.: *See—*
Matsuoka, Yoshiyuki; Hosaka, Kunio; Takeda, Shigefumi; and Mitsuhashi, Hiroshi, 4,962,211, Cl. 549-436.000.

Tsuruoka, Michihiko; Nakagawa, Wataru; Machida, Masashi; and Kounosu, Naohiro, to Fuji Electric Co., Ltd. Vibration type transducer. 4,961,345, Cl. 73-32.00A.

Tsushima, Susumu; Takatani, Muneo; and Nishikawa, Kohei, to Takeda Chemical Industries, Ltd. Pyridinium derivatives, their production and use. 4,962,113, Cl. 514-307.000.

Tsutsumi, Kenichi; and Yoshino, Jun, to Casio Computer Co., Ltd. Musical tone generating apparatus for synthesizing musical tone signal by combining component wave signals. 4,961,364, Cl. 84-627.000.

Tuchermann, Herta: *See—*
Kresse, Franz; Osberghaus, Rainer; Scheller, Bernfrid; Schunter, Roland; and Tuchermann, Herta, 4,961,242, Cl. 15-228.000.

Turner, Ralph W., to Imperial Chemical Industries PLC. Dihydropyran derivatives. 4,962,209, Cl. 549-419.000.

Tutor Toys, Inc.: *See—*
Thompson, Barbara J.; Bingham, Russell D.; and Holmes, William, Jr., 4,961,579, Cl. 273-153.00R.

Twin City International, Inc.: *See—*
Spongr, Jerry J.; and Sawyer, Byron E., 4,962,518, Cl. 378-50.000.

Tyler, Stephen L.; and Staylor, John L., to Toro Company, The. Sprinkler nozzle module. 4,961,534, Cl. 239-205.000.

Tymn, Gary P. Remotely activated timer alert system. 4,962,367, Cl. 340-309.400.

Ube Industries, Ltd.: *See—*
Yamada, Senichi; Towata, Shinichi; Ikuno, Hajime; Yamamura, Takemi; Ishikawa, Toshihiro; and Shibuya, Masaki, 4,961,990, Cl. 428-240.000.

Ucar Carbon Technology Corporation: *See—*
Howard, Ronald A., 4,961,991, Cl. 428-246.000.

Uchida, Manabu: *See—*
Yoshida, Naoyuki; Kaneoya, Masakazu; Uchida, Manabu; and Morita, Hiroshi, 4,962,031, Cl. 435-280.000.

Uchida, Wataru: *See—*
Shiraishi, Takeichi; Uchida, Wataru; and Matsuura, Kazuo, 4,962,167, Cl. 526-125.000.

Uchiyama, Makoto; and Nojiri, Hidetoshi, to Nissan Motor Company, Limited. Method of tightly joining two semiconductor substrates. 4,962,062, Cl. 437-225.000.

Ueda, Atsushi: *See—*
Matsumura, Masami; Hayashi, Masahiro; and Ueda, Atsushi, 4,961,410, Cl. 123-414.000.

Ueda, Masahide, to Minolta Camera Kabushiki Kaisha. Electrophotographic copying apparatus having toner image density measuring arrangement for detecting toner concentration. 4,962,407, Cl. 355-208.000.

Uede, Hisashi: *See—*
Fujioka, Yoshihide; Kanatani, Yoshiharu; Ohba, Toshihiro; and Uede, Hisashi, 4,962,374, Cl. 340-781.000.

Uehara, Masafumi; Nogami, Akira; Shimura, Kazuhiro; Yumiki, Keiichi; and Iwaki, Akio, to Konica Corporation. Method of treating an aqueous processing waste solution of a non-silver halide light-sensitive material and a device therefor. 4,961,859, Cl. 210-725.000.

Uhrin, Robert: *See—*
Belt, Roger F.; and Uhrin, Robert, 4,962,087, Cl. 505-1.000.

Uken, William D.; and Tomita, Akira, to Raychem Corporation. Optical bypass switch. 4,961,620, Cl. 350-96.150.

Ullman, Allan. Radio frequency signal and power distribution duct. 4,962,447, Cl. 361-422.000.

Ullrich, Gunter: *See—*
Andra, Rainer H.; and Ullrich, Gunter, 4,961,254, Cl. 29-173.000.
Umaba, Toshihiko: *See—*
Hashimoto, Yutaka; Yumoto, Masanobu; Umaba, Toshihiko; Kamada, Yutaka; Matsubara, Tsutomu; and Kawaguchi, Sigeo, 4,961,976, Cl. 428-34.600.
Une, Mizuho: *See—*
Mosbach, Erwin H.; McSherry, Charles K.; Une, Mizuho; and Matoba, Naoyuki, 4,962,099, Cl. 514-177.000.
UNEX Corporation: *See—*
Spirer, Steve, 4,961,445, Cl. 137-614.040.
Ungerer, Heinz-Jurgen: *See—*
Hirschmann, Clemens; Ungerer, Heinz-Jurgen; and Mellem, Joachim, 4,961,695, Cl. 425-72.200.
Unilever Patent Holdings B.V.: *See—*
Barnes, Douglas J.; and Savoni, Eduardo, 4,961,949, Cl. 426-518.000.
Union Camp Corporation: *See—*
Johnson, Robert W., Jr., 4,962,186, Cl. 530-218.000.
Union Carbide Chemicals and Plastics Company Inc.: *See—*
Blevins, Charles H.; Greene, George H.; Matlock, Paul L.; and Murphy, Gerald J., 4,962,218, Cl. 556-445.000.
Union Carbide Corporation: *See—*
Halvorson, Thomas G.; and Schaub, Herbert R., 4,961,325, Cl. 62-48.100.
Union Oil Company of California: *See—*
Harbolt, Bruce A.; and Moerdyke, Donald D., 4,962,283, Cl. 564-63.000.
Uniroyal Chemical Company, Inc.: *See—*
Bandlish, Baldev K.; Loveless, Frederick C.; and Nudenberg, Walter, 4,962,234, Cl. 564-384.000.
Uniroyal Goodrich Tire Company, The: *See—*
Bailey, David W., 4,961,813, Cl. 156-406.400.
Unisys Corporation: *See—*
Byers, Larry L.; Scheuneman, James H.; and Desubijana, Joseba M., 4,962,501, Cl. 371-51.100.
Kingston, Samuel C., 4,962,508, Cl. 375-1.000.
United American, Inc.: *See—*
Pennartz, Edmond R. J., 4,961,865, Cl. 252-7.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
McGill, Keith R., 4,961,369, Cl. 89-41.110.
United States of America
Agriculture: *See—*
Arifoglu, Mustafa; and Marmer, William N., 4,961,752, Cl. 8-111.000.
Sawhney, A. Paul S.; Folk, Craig L.; Robert, Kearny Q.; and Kimmel, Linda B., 4,961,306, Cl. 57-12.000.
Slininger, Patricia J.; Vancauwenberge, James E.; and Bothast, Rodney J., 4,962,027, Cl. 435-147.000.
Air Force: *See—*
Durrenberg, Richard O., 4,962,424, Cl. 358-103.000.
Taylor, Richard L.; Drosd, Ralph D., deceased; and Gregory, Luther W., administrator, 4,962,534, Cl. 380-34.000.
America: *See—*
Jett, James H.; Keller, Richard A.; Martin, John C.; Moyzis, Robert K.; Ratliff, Robert L.; Shera, E. Brooks; and Stewart, Carleton C., 4,962,037, Cl. 435-6.000.
Army: *See—*
DenHartog, Stephen L.; Zarling, John P.; and Haynes, Francis D., 4,961,463, Cl. 165-45.000.
Holderfield, Daron C.; Martin, Bernard E.; and Russell, Samuel S., 4,962,355, Cl. 324-158.00F.
Sayles, David C., 4,961,384, Cl. 102-519.000.
Commerce: *See—*
Bruno, Thomas J., 4,967,275, Cl. 585-834.000.
Energy: *See—*
Jason, Andrew J.; and Blind, Barbara, 4,962,317, Cl. 250-396.0ML.
Environmental Protection Agency: *See—*
Stevens, Robert K.; and Stone, Charles, 4,961,966, Cl. 427-299.000.
National Aeronautics and Space Administration: *See—*
Lierke, Ernst G.; Leung, Emily W.; and Bhat, Balakrishna T., 4,962,330, Cl. 310-323.000.
Navy: *See—*
Chu, Tak-Kin, 4,962,303, Cl. 250-208.100.
Fishman, Steven G.; Rozner, Alexander G.; Wiley, Raymond C.; and Wishard, William N., 4,961,383, Cl. 102-517.000.
Higa, Kelvin T.; and Harris, Daniel C., 4,962,216, Cl. 556-129.000.
Jordan, Arthur K.; and Lakshmanasamy, S., 4,961,618, Cl. 350-96.120.
Novinson, Thomas, 4,961,786, Cl. 106-692.000.
Repp, Bradley A.; Wurm, Albert M.; Simonoff, Adam J.; and Courtney, Spencer R., 4,962,371, Cl. 340-626.000.
Schwee, Leonard J., 4,962,477, Cl. 365-87.000.
U.S. Philips Corporation: *See—*
Albach, Manfred; and Raets, Hubert C., 4,962,349, Cl. 323-265.000.
Bayer, Ernst; and Fischer, Karl, 4,962,436, Cl. 360-96.300.
Bormans, Bernardus J. M.; and Bakker, Johan G., 4,962,308, Cl. 250-396.00R.
Cornelissen, Bernardus H. J., 4,962,471, Cl. 364-787.000.
Frijlink, Peter M., 4,961,399, Cl. 118-730.000.
Kramer, Pieter; and Roos, Jan, 4,962,493, Cl. 369-44.110.
Kunze, Norbert, 4,962,438, Cl. 360-130.210.
Lemonier, Michel G., 4,962,429, Cl. 358-213.130.
Peters, Petrus J. M., 4,961,528, Cl. 228-123.000.
Sipman, Wilhelmus H. M.; and Snel, Lambertus, 4,962,531, Cl. 380-24.000.
Sluyterman, Albertus A. S., 4,962,333, Cl. 313-440.000.
Van Hoof, Leonardus; Mateika, Dieter; Laudan, Horst; Pistorius, Johannes; and Haisma, Jan, 4,961,919, Cl. 423-598.000.
Verstraete, Rik A., 4,962,458, Cl. 364-443.000.
United Technologies Corporation: *See—*
Brooke, Arthur W., Jr., 4,961,771, Cl. 65-18.300.
Law, Chi C.; and Russell, Scott M., 4,961,905, Cl. 420-460.000.
Pike, Roscoe A., 4,961,971, Cl. 427-376.200.
United Techologies Corporation: *See—*
Fournier, Joseph T., Jr.; Smith, Stephen J.; McKinley, Harry R.; and McLean, William E., 4,961,626, Cl. 350-174.000.
Univ. of Calif., The Regents of the: *See—*
Desphandey, Chandra V.; Bumshah, Rointan F.; and Doerr, Hans J., 4,961,958, Cl. 427-38.000.
University of Alabama in Huntsville, The: *See—*
Chipman, Russell; and Chenault, David, 4,961,634, Cl. 350-403.000.
University of Arkansas, The: *See—*
Brown, William D.; and Khaliq, Muhammad A., 4,962,065, Cl. 437-242.000.
Hermann, Allen M.; and Sheng, Zhengzhi, 4,962,083, Cl. 505-1.000.
University of British Columbia: *See—*
Orlando, Ramon A., 4,961,737, Cl. 604-385.200.
University of Florida: *See—*
Goldberg, Eugene P.; Burns, James W.; Kumar, G. Sudesh; Osborn, David C.; Larson, Jeffrey A.; Sheets, John W.; Yahiaoui, Ali; and Robinson, Richard, 4,961,954, Cl. 427-2.000.
Magnusson, Ingvar; and Batich, Christopher, 4,961,707, Cl. 433-215.000.
University of Houston - University Park: *See—*
Gorman, Michael A.; Sterling, Mark H.; Kiehn, Robert M.; and Wood, Lowell T., 4,961,622, Cl. 350-96.180.
University of Maryland: *See—*
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Ou, John D., 4,961,881, Cl. 260-428.500.
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Stine, Laurence O.; Reno, Mark E.; Munro, William H.; and Hamper, Simon J., 4,961,839, Cl. 208-102.000.
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Upadhya, Kamleshwar, to General Electric Company. Lubricated bearing retainer for X-ray tube. 4,962,519, Cl. 378-133.000.
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Van Daele, Georges, to Janssen Pharmaceutica N.V. Novel N-(3-hydroxy-4-piperidinyl)benzamide derivatives. 4,962,115, Cl. 514-326.000.
Van Den Akker, Hendrikus E. A.; Everts, Rudi; Woudstra, Jouke J.; Barnes, Peter H.; Verheul, Cornelis M.; and Dirkse, Hendrik A., to

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Walker, Charles W. E. Microwave antenna apparatus. 4,962,384, Cl. 343-786.000.

Walker, Michael S.: *See—*
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White, Frederic H., III; Hu, Patrick H.; and Bettis, Jerry R., to Rockwell International Corporation. Magnetic optics adaptive technique. 4,962,309, Cl. 250-396.00R.

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Whittaker, Richard W. Multi-magnetic field plural core transformer. 4,962,362, Cl. 336-175.000.

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Wick, Gertrud: *See*—
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Yamaoka, Fumiyuki; Kakizaki, Shinobu; and Kikushima, Shigeru, to Atsugi Motor Parts, Limited. Variable damping characteristics shock absorber with feature of generation of piston stroke direction indicative signal. 4,961,483, Cl. 188-299.000.

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Yan, Tsoung Y., to Mobil Oil Corporation. Process for removing mercury from water or hydrocarbon condensate. 4,962,276, Cl. 585-867.000.

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Yoshida, Akihiko; and Nakasuji, Yoshizumi, to NGK Insulators, Ltd. Ceramic-metal composite bodies, and process and apparatus for manufacturing the same. 4,962,002, Cl. 428-609.000.

Yoshida, Hajime; Hanai, Nobuo; and Furuya, Akiko, to Kyowa Hakko Kogyo Co., Ltd. Anti-lafora body monoclonal antibody. 4,962,032, Cl. 435-240.270.

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Yoshida, Takao; and Suzuki, Tatsuo, to Material Engineering Technology Laboratory, Incorporated. Plastic container having an easy-to-peel seal forming compartments. 4,961,495, Cl. 206-219.000.

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Asayama, Kyoichiro; Miyazawa, Hiroyuki; Kobayashi, Yutaka; and Yukutake, Seigou, 4,962,052, Cl. 437-31.000.

Yumiki, Keiichi: *See*—
Uehara, Masafumi; Nogami, Akira; Shimura, Kazuhiro; Yumiki, Keiichi; and Iwaki, Akio, 4,961,859, Cl. 210-725.000.

Yumoto, Masanobu: *See*—
Hashimoto, Yutaka; Yumoto, Masanobu; Umaba, Toshihiko; Kamada, Yutaka; Matsubara, Tsutomu; and Kawaguchi, Sigeo, 4,961,976, Cl. 428-34.600.

Yutani, Yuji: *See*—
Tatemoto, Masayoshi; Yutani, Yuji; and Fujiwara, Koji, 4,962,236, Cl. 568-615.000.

Yuyama, Harumi: *See*—
Kato, Yoshiaki; Yuyama, Harumi; Ojima, Tutomu; and Ishikawa, Hiromi, 4,962,485, Cl. 365-229.000.

Zabel, Steven: *See*—
Clark, Douglas W.; and Zabel, Steven, 4,961,568, Cl. 272-68.000.

Zaenger, Ian C.: *See*—
Sikkenga, David; Zaenger, Ian C.; and Williams, Gregory S., 4,962,260, Cl. 585-481.000.

Zahnradfabrik Friedrichshafen AG: *See*—
Huff, Martin; and Kuchelmeister, Ulrich L., 4,961,485, Cl. 192-4.00A.

Zamboni, Robert: *See*—
Young, Robert N.; Williams, Haydn W. R.; Leger, Serge; Frenette, Richard; and Zamboni, Robert, 4,962,203, Cl. 546-180.000.

Zamudio-Tena, J. Francisco: *See*—
Cherukuri, Subraman R.; Orlandi, Daniel A.; Faust, Steven M.; and Zamudio-Tena, J. Francisco, 4,961,935, Cl. 426-3.000.

Zang, Thomas: *See*—
Wollbeck, Rudi; and Zang, Thomas, 4,961,464, Cl. 165-83.000.

Zapp, Regie H.: *See*—
Halm, Roland L.; and Zapp, Regie H., 4,962,220, Cl. 556-473.000.

Zarling, John P.: *See*—
DenHartog, Stephen L.; Zarling, John P.; and Haynes, Francis D., 4,961,463, Cl. 165-45.000.

Zaschke, Horst: *See*—
Demus, Dietrich; Zaschke, Horst; Weissflog, Wolfgang; Mohr, Kristina; Kohler, Saskia; and Worm, Kerstin, 4,961,876, Cl. 252-299.670.

Zhejiang CI XI Seal Material Factory: *See*—
Zhu, Di Xiang, 4,961,988, Cl. 428-229.000.

Zhu, Di Xiang, to Zhejiang CI XI Seal Material Factory. General packing of expanded graphite. 4,961,988, Cl. 428-229.000.

Zhuo, Ruixing: *See*—
Xu, Changxiang; Yu, Oiulin; and Zhuo, Ruixing, 4,961,268, Cl. 33-568.000.

Ziegler, Gerd: *See*—
Kleis, Rudolf; and Ziegler, Gerd, 4,961,339, Cl. 73-73.000.

Ziesel, Lawrence B.: *See*—
Credle, William S., Jr.; Ziesel, Lawrence B.; and Heflin, Mark S., 4,961,447, Cl. 141-1.000.

Zimmerling, Dieter; Schmidt, Johannes E.; Seubert, Rolf; Fischer, Karl; and Sauer, Friedrich, to BASF Aktiengesellschaft. Obtaining very pure maleic anhydride from crude maleic anhydride. 4,961,827, Cl. 203-87.000.

Zimmerman, Mark B.: *See*—
Ksander, Gary M.; and Zimmerman, Mark B., 4,962,105, Cl. 514-212.000.

Zinnen, Hermann A.; and Johnson, Steven P., to UOP. Purification of alpha naphthol-containing feedstock by adsorption. 4,962,273, Cl. 585-831.000.

Zlotek, David A., to Cirrus Technology Inc. Exposure controlled imaging system. 4,962,385, Cl. 346-1.100.

Zucker, Shlomo: *See*—
Avrahami, Zohar; Larom, Dov; Zucker, Shlomo; and Gross, Joseph, 4,961,885, Cl. 261-142.000.

2V Industries, Inc.: *See*—
Benczyk, Donald T., 4,962,039, Cl. 436-40.000.

501 Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See*—
Hiratsuna, Satoshi; and Hotta, Hiroshi, 4,962,168, Cl. 526-193.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 9TH DAY OF OCTOBER, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AP Parts Manufacturing Company: *See*—
Harwood, Jon, Re. 33,370, Cl. 181-282.000.

AT&T Bell Laboratories: *See*—
Cheng-Quispe, Enrique; Dennis, Thomas M.; Fulcomer, Emanuel J., Jr.; Malek, George; and Tong, Shih Y., Re. 33,380, Cl. 375-7.000.

Bencloski, William A.: *See*—
Gallo, Frank G.; Swenson, Clark E.; Bencloski, William A.; Cassette, Angelo J.; Mano, John L.; and Parlak, Edward A., Re. 33,373, Cl. 376-260.000.

Bhattacharjee, Amal C., to Nabisco Brands, Inc. Forced air/gas burner and baking oven incorporating same. Re. 33,374, Cl. 426-523.000.

Black & Decker Inc.: *See*—
Bradus, Robert, Re. 33,379, Cl. 388-802.000.

Bradus, Robert, to Black & Decker Inc. Microprocessor based motor control. Re. 33,379, Cl. 388-802.000.

Branlard, Paul; and Merle, Jean-Pierre, to Distugil. Method of preparing sulfur-modified polychloroprene. Re. 33,377, Cl. 525-345.000.

Brown, Dennis M.: *See*—
Luck, Edward E.; and Brown, Dennis M., Re. 33,375, Cl. 514-2.000.

Cassette, Angelo J.: *See*—
Gallo, Frank G.; Swenson, Clark E.; Bencloski, William A.; Cassette, Angelo J.; Mano, John L.; and Parlak, Edward A., Re. 33,373, Cl. 376-260.000.

Cheng-Quispe, Enrique; Dennis, Thomas M.; Fulcomer, Emanuel J., Jr.; Malek, George; and Tong, Shih Y., to AT&T Bell Laboratories. Voiceband data set. Re. 33,380, Cl. 375-7.000.

Dennis, Thomas M.: *See*—
Cheng-Quispe, Enrique; Dennis, Thomas M.; Fulcomer, Emanuel J., Jr.; Malek, George; and Tong, Shih Y., Re. 33,380, Cl. 375-7.000.

Distugil: *See*—
Branlard, Paul; and Merle, Jean-Pierre, Re. 33,377, Cl. 525-345.000.

Frolow, Jack L. Tennis racket. Re. 33,372, Cl. 273-73.00C.

Fulcomer, Emanuel J., Jr.: *See*—
Cheng-Quispe, Enrique; Dennis, Thomas M.; Fulcomer, Emanuel J., Jr.; Malek, George; and Tong, Shih Y., Re. 33,380, Cl. 375-7.000.

Gallo, Frank G.; Swenson, Clark E.; Bencloski, William A.; Cassette, Angelo J.; Mano, John L.; and Parlak, Edward A., to Westinghouse Electric Corp. Tooling apparatus for modifying nuclear reactors. Re. 33,373, Cl. 376-260.000.

Gibbons, Charles E.; Tanner, Cynthia L.; and Whillock, Allan A., to International Paper Company. Non-foil composite structures for packaging juice. Re. 33,376, Cl. 428-34.200.

Harwood, Jon, to AP Parts Manufacturing Company. Stamp formed muffler. Re. 33,370, Cl. 181-282.000.

International Paper Company: *See*—
Gibbons, Charles E.; Tanner, Cynthia L.; and Whillock, Allan A., Re. 33,376, Cl. 428-34.200.

Kahn, Leonard R. Multiple system AM stereo receiver and pilot signal detector. Re. 33,381, Cl. 381-15.000.

Luck, Edward E.; and Brown, Dennis M., to Matrix Pharmaceuticals, Inc. Treatments employing drug-containing matrices for introduction into cellular lesion areas. Re. 33,375, Cl. 514-2.000.

Malek, George: *See*—
Cheng-Quispe, Enrique; Dennis, Thomas M.; Fulcomer, Emanuel J., Jr.; Malek, George; and Tong, Shih Y., Re. 33,380, Cl. 375-7.000.

Mano, John L.: *See*—
Gallo, Frank G.; Swenson, Clark E.; Bencloski, William A.; Cassette, Angelo J.; Mano, John L.; and Parlak, Edward A., Re. 33,373, Cl. 376-260.000.

Matrix Pharmaceuticals, Inc.: *See*—
Luck, Edward E.; and Brown, Dennis M., Re. 33,375, Cl. 514-2.000.

Mehl, Byron R., to Sundstrand Corporation. Incremental base drive circuit for a power transistor. Re. 33,378, Cl. 307-270.000.

Merle, Jean-Pierre: *See*—
Branlard, Paul; and Merle, Jean-Pierre, Re. 33,377, Cl. 525-345.000.

Nabisco Brands, Inc.: *See*—
Bhattacharjee, Amal C., Re. 33,374, Cl. 426-523.000.

Parlak, Edward A.: *See*—
Gallo, Frank G.; Swenson, Clark E.; Bencloski, William A.; Cassette, Angelo J.; Mano, John L.; and Parlak, Edward A., Re. 33,373, Cl. 376-260.000.

Shoher, Itzhak; and Whiteman, Aharon. Method and material for dental structures. Re. 33,371, Cl. 164-80.000.

Sundstrand Corporation: *See*—
Mehl, Byron R., Re. 33,378, Cl. 307-270.000.

Swenson, Clark E.: *See*—
Gallo, Frank G.; Swenson, Clark E.; Bencloski, William A.; Cassette, Angelo J.; Mano, John L.; and Parlak, Edward A., Re. 33,373, Cl. 376-260.000.

Tanner, Cynthia L.: *See*—
Gibbons, Charles E.; Tanner, Cynthia L.; and Whillock, Allan A., Re. 33,376, Cl. 428-34.200.

Tong, Shih Y.: *See*—
Cheng-Quispe, Enrique; Dennis, Thomas M.; Fulcomer, Emanuel J., Jr.; Malek, George; and Tong, Shih Y., Re. 33,380, Cl. 375-7.000.

Westinghouse Electric Corp.: *See*—
Gallo, Frank G.; Swenson, Clark E.; Bencloski, William A.; Cassette, Angelo J.; Mano, John L.; and Parlak, Edward A., Re. 33,373, Cl. 376-260.000.

Whillock, Allan A.: *See*—
Gibbons, Charles E.; Tanner, Cynthia L.; and Whillock, Allan A., Re. 33,376, Cl. 428-34.200.

Whiteman, Aharon: *See*—
Shoher, Itzhak; and Whiteman, Aharon, Re. 33,371, Cl. 164-80.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Brookfield, David A. Viscometer with a continuously variable electronic readout. B1 4,448,061, 10-9-90, Cl. 73-59.000.

Eli Lilly and Company: *See*—
Raun, Arthur P., B1 3,794,732, Cl. 514-460.000.

Raun, Arthur P., to Eli Lilly and Company. Ruminant feed utilization improvement. B1 3,794,732, 10-9-90, Cl. 514-460.000.

LIST OF DESIGN PATENTEES

A.C.E.A. Manodomestici S.r.L.: *See*—
Magaraggia, Antonietta, nee Ferrighi, 311,113, Cl. D7-596.000.

A.W. Faber-Castell Unternehmungsverwaltung GmbH & Co.: *See*—
Jankewitz, Axel, 311,258, Cl. D28-7.000.

Abraham, Tim. Floating beverage carrier. 311,115, 10-9-90, Cl. D7-616.000.

Acer Incorporated: *See*—
Cheng, Joe S.; and Roun, Ben-Shi, 311,173, Cl. D14-100.000.
Lee, Cheng-Chang; and Lin, Morris J., 311,174, Cl. D14-100.000.

Action Products Co., Inc.: *See*—
Smith, Larry D.; and Tanner, Robert G., 311,104, Cl. D6-495.000.

Allard, Peter B.; Weiss, Michael R.; and Bleck, Gregory D., to Thermo King Corporation. Cover for a transport refrigeration unit. 311,244, 10-9-90, Cl. D23-325.000.

Allegretti & Company: *See*—
Pilatowicz, Edward J.; Carsello, Anthony; and Landy, Richard, 311,121, Cl. D8-8.000.

Althans, Richard K., to Wico Distribution Corp. Joystick. 311,218, 10-9-90, Cl. D21-48.000.

American Cyanamid Company: *See*—
Petersen, Bryan E.; and Kanceljak, Michael, 311,235, Cl. D22-119.000.
Petersen, Bryan E.; and Kanceljak, Michael, 311,236, Cl. D22-119.000.
Petersen, Bryan E.; and Kanceljak, Michael, 311,237, Cl. D22-119.000.
Petersen, Bryan E.; and Kanceljak, Michael, 311,238, Cl. D22-119.000.

American Recreation Products, Inc.: *See*—
Scherer, Michael J., 311,094, Cl. D3-32.000.

Ancona, Bruce: *See*—
Ancona, Jane; and Ancona, Bruce, 311,213, Cl. D19-77.000.

Ancona, Jane; and Ancona, Bruce, to M. Kamenstein, Inc. Pencil cup. 311,213, 10-9-90, Cl. D19-77.000.

Andersson, Carl-Axel: *See*—
Andersson, Kjell; and Andersson, Carl-Axel, 311,193, Cl. D15-139.000.

Andersson, Kjell; and Andersson, Carl-Axel, to Seco Tools AB. Head for a cutting tool. 311,193, 10-9-90, Cl. D15-139.000.

Ando, Takaharu, to Kabushiki Kaisha Toshiba. Telephone set. 311,191, 10-9-90, Cl. D14-241.000.

Appleby, Paul, to Dialatron Limited. Telephone answering machine. 311,184, 10-9-90, Cl. D14-141.000.

Arami-Nikjeh, Jalil. Combined practice kick bag stand and support. 311,234, 10-9-90, Cl. D21-199.000.

Architectural Creative Lighting, Inc.: *See*—
Malinovsky, Constantin, 311,214, Cl. D20-42.000.

Artemide S.p.A.: *See*—
Frattini, Gianfranco, 311,256, Cl. D26-87.000.

Asano, Shinichi, to Car Mate Manufacturing Company Limited. Automobile pedal. 311,166, 10-9-90, Cl. D12-174.000.

Ashley Furniture Industries, Inc.: *See*—
Pauer, Jericho P.; and Pronschinske, Jane, 311,101, Cl. D6-446.000.

Australux North America Limited: *See*—
Spotts, James C., 311,255, Cl. D26-67.000.

Avey, D. Jean. Hard hat head protector. 311,261, 10-9-90, Cl. D29-16.000.

Bain, Charles E., to Bell & Howell Company. Mail sorter. 311,179, 10-9-90, Cl. D14-110.000.

Barker, Jimmie D.; and Shortino, Vincent M., to Clorox Company, The. Bottle. 311,136, 10-9-90, Cl. D9-378.000.

Barnhill, George T., III, to 911 Inc. Golf cart umbrella bracket. 311,129, 10-9-90, Cl. D8-373.000.

Bell & Howell Company: *See*—
Bain, Charles E., 311,179, Cl. D14-110.000.

Berger Instruments: *See*—
Hayashi, Mikio, 311,145, Cl. D10-66.000.

Bergh Bros. Co., Inc.: *See*—
Bergh, George G., 311,219, Cl. D19-26.000.

Bergh, George G., to Bergh Bros. Co., Inc. Combination picture frame and expandable photo album. 311,219, 10-9-90, Cl. D19-26.000.

Berthet-Bondet, Pierre, to Societe Berthet-Bondet. Sun glasses. 311,195, 10-9-90, Cl. D16-102.000.

BFD, Inc.: *See*—
Russell, John P., 311,263, Cl. D29-17.000

Bleck, Gregory D.: *See*—
Allard, Peter B.; Weiss, Michael R.; and Bleck, Gregory D., 311,244, Cl. D23-325.000.

Boivin, Josette. Scarf slide. 311,157, 10-9-90, Cl. D11-202.000.

Born, Gerald W., to Quality Products, Inc. Pump sprayer pressure tank or similar article. 311,240, 10-9-90, Cl. D23-225.000.

Bottcher, Dallas R. Combined palette and holder therefor. 311,210, 10-9-90, Cl. D19-35.000.

Breveglieri, Franklin L., to Geerpres, Inc. Article holding device. 311,128, 10-9-90, Cl. D8-373.000.

Bull, Dale E., to Engine Service Specialist Inc. Service building. 311,253, 10-9-90, Cl. D25-33.000.

Butler, Anthony R., to Loctite Corporation. Container closure. 311,139, 10-9-90, Cl. D9-443.000.

Byram, David C.: *See*—
Nash, James E.; Byram, David C.; and Fairchild, John F., 311,182, Cl. D14-114.000.

Cain, Sherna F., to Triple H. Industries, Inc. Air freshener doll. 311,246, 10-9-90, Cl. D23-368.000.

Car Mate Manufacturing Company Limited: *See*—
Asano, Shinichi, 311,166, Cl. D12-174.000.

Carsello, Anthony: *See*—
Pilatowicz, Edward J.; Carsello, Anthony; and Landy, Richard, 311,121, Cl. D8-8.000.

Casagrande, John T. Shoulder camera mount. 311,199, 10-9-90, Cl. D16-243.000.

Casio Computer Co., Ltd.: *See*—
Hayashi, Masaki, 311,204, Cl. D18-1.000.
Murata, Ryo, 311,141, Cl. D10-15.000.

Cautereels, Victor J. J.; DeCoster, Pieter K. J.; and Daenen, Robert H. C. M., to Dart Industries Inc. Kitchen utensil or the like. 311,120, 10-9-90, Cl. D7-688.000.

Chanel, Arthur, to Fromageries Bresse-Bleu - Societe Laitiere Cooperative Agricole. Package. 311,138, 10-9-90, Cl. D9-425.000.

Cheng, Joe S.; and Roun, Ben-Shi, to Acer Incorporated. Computer. 311,173, 10-9-90, Cl. D14-100.000.

Cheng, Peter S. C. Pull bow. 311,156, 10-9-90, Cl. D11-184.000.

Chiassi, Lanfranco, to LT Terraneo S.p.A. Apparatus for use as house-phone and/or internal phone. 311,185, 10-9-90, Cl. D14-142.000.

Ching-Hwei, Lan. Automobile license plate holder. 311,167, 10-9-90, Cl. D12-193.000.

Chirieleison, Michael I. Finger ring. 311,153, 10-9-90, Cl. D11-32.000.

Choi, Suk J., to Goldstar Co., Ltd. Dehumidifier. 311,245, 10-9-90, Cl. D23-359.000.

Cine Coasters Inc.: *See*—
Stern, Jon L.; Katz, Richard S., Jr.; and Hippely, Keith A., 311,105, Cl. D6-501.000.

Cipel: *See*—
Clair, Pierre Y., 311,254, Cl. D26-49.000.

Citizen Watch Co., Ltd.: *See*—
Mitsuhashi, Toshio, 311,205, Cl. D18-13.000.
Mitsuhashi, Toshio, 311,207, Cl. D18-13.000.
Sugimoto, Isao, 311,206, Cl. D18-13.000.

Clair, Pierre Y., to Cipel. Flashlight. 311,254, 10-9-90, Cl. D26-49.000.

Clorox Company, The: *See*—
Barker, Jimmie D.; and Shortino, Vincent M., 311,136, Cl. D9-378.000.

Coats & Clark, Inc.: *See*—
Wolff, Joan P., 311,117, Cl. D7-675.000.
Wolff, Joan P., 311,118, Cl. D7-675.000.

Command Automation, Inc.: *See*—
Simjian, Luther G., 311,216, Cl. D21-8.000.

Commercial Brains Limited: *See*—
Whitaker, Richard J., 311,130, Cl. D8-381.000.

Conopco, Inc.: *See*—
Wiseman, Kay E.; and Kichenside, Brian E., 311,133, Cl. D9-370.000.

Cooper, Colin L. Sailboard hand grip. 311,168, 10-9-90, Cl. D21-317.000.

Cowan, Murray L., to Textron, Inc. Expansion bracelet. 311,152, 10-9-90, Cl. D11-19.000.

Crowley, Joseph. Shelf extending mounting bracket for additional product display. 311,126, 10-9-90, Cl. D8-354.000.

Curry, Judith A. Health worker's face shield. 311,262, 10-9-90, Cl. D29-17.000.

Daenen, Robert H. C. M.: *See*—
Cautereels, Victor J. J.; DeCoster, Pieter K. J.; and Daenen, Robert H. C. M., 311,120, Cl. D7-688.000.

Dart Industries Inc.: *See*—
Cautereels, Victor J. J.; DeCoster, Pieter K. J.; and Daenen, Robert H. C. M., 311,120, Cl. D7-688.000.

Das, Gloria E. Shell earrings. 311,154, 10-9-90, Cl. D11-48.000.

DeCoster, Pieter K. J.: *See*—
Cautereels, Victor J. J.; DeCoster, Pieter K. J.; and Daenen, Robert H. C. M., 311,120, Cl. D7-688.000.

Dialatron Limited: *See*—
Appleby, Paul, 311,184, Cl. D14-141.000.

Dinand, Pierre, to Florbath - Profumi Di Parma SpA. Perfume bottle. 311,132, 10-9-90, Cl. D9-367.000.

DM Systems, Inc.: *See*—
Drennan, Denis B.; and Maylahn, Donald J., 311,232, Cl. D21-191.000.

Douglas, Agnes F. Automobile travel blind for infant. 311,164, 10-9-90, Cl. D12-155.000.

Drennan, Denis B.; and Maylahn, Donald J., to DM Systems, Inc. Ankle exerciser or similar article. 311,232, 10-9-90, Cl. D21-191.000.

Dunnigan, Michael J. Nuclear radiation boot. 311,090, 10-9-90, Cl. D2-274.000.

Ekco Housewares, Inc.: *See*—
Hiscott, William D.; Witlin, Ina; Hasler, Theodore J.; and Jastrzebski, Andrew T., 311,111, Cl. D7-409.000.

Emmons, Mickie C., to Kamper Family, Inc., The. Doll. 311,231, 10-9-90, Cl. D21-171.000.

Engine Service Specialist Inc.: *See*—
Bull, Dale E., 311,253, Cl. D25-33.000.

Eriksson, Borje: *See*—
Johnsson, Nils; Eriksson, Borje; and Rosenblad, Lars G., 311,122, Cl. D8-49.000.

Eyemetrics-Systems AG: *See—*
Wiedmann, Helmut, 311,196, Cl. D16-126.000.
Fairchild, John F.: *See—*
Nash, James E.; Byram, David C.; and Fairchild, John F., 311,182, Cl. D14-114.000.
Farley, David L. Foam pad. 311,108, 10-9-90, Cl. D6-596.000.
Fate Socieded Anonima Industrial Comercial e Imobiliaria: *See—*
Rabinovich, Delfin A., 311,163, Cl. D12-147.000.
Florbath - Profumi Di Parma SpA: *See—*
Dinand, Pierre, 311,132, Cl. D9-367.000.
Folson, Audrey C. Greeting card album. 311,208, 10-9-90, Cl. D19-27.000.
Frattini, Gianfranco, to Artemide S.p.A. Wall lamp. 311,256, 10-9-90, Cl. D26-87.000.
French, John L. Drill screw bit holder. 311,107, 10-9-90, Cl. D6-553.000.
Fromageries Bresse-Bleu - Societe Laitiere Cooperative Agricole: *See—*
Chanel, Arthur, 311,138, Cl. D9-425.000.
Fuji, Yuzo; and Yasuno, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Television receiver. 311,183, 10-9-90, Cl. D14-126.000.
Geerpres, Inc.: *See—*
Breveglieri, Franklin L., 311,128, Cl. D8-373.000.
Gelardi, Anthony; Lowry, Alan; and Lovecky, Craig, to Shape Inc. Theft resistant container. 311,137, 10-9-90, Cl. D9-418.000.
General Mills, Inc.: *See—*
Sweatt, Blaine, III; and Moorman, Stephen E., 311,112, Cl. D7-542.000.
Geschwender, Robert C. Head and neck support attachment for a headrest. 311,109, 10-9-90, Cl. D6-601.000.
Goldstar Co., Ltd.: *See—*
Choi, Suk J., 311,245, Cl. D23-359.000.
Goodner, Douglas E., to International Business Machines Corporation. Point of sale terminal. 311,178, 10-9-90, Cl. D14-105.000.
Grey, Jonathan, to Smallbone, Inc. Cupboard. 311,100, 10-9-90, Cl. D6-437.000.
Guevara, Elena R. Hat. 311,089, 10-9-90, Cl. D2-248.000.
Hackett, David E.; Hunter, Kevin K.; and Matsumoto, Kintaro, to Toyota Jidosha Kabushiki Kaisha. Pickup truck body. 311,160, 10-9-90, Cl. D12-98.000.
Hagberg, Knut; and Hagberg, Marianne, to Ikea of Sweden AB. Clock. 311,142, 10-9-90, Cl. D10-24.000.
Hagberg, Marianne: *See—*
Hagberg, Knut; and Hagberg, Marianne, 311,142, Cl. D10-24.000.
Hall, John W. Water cooler. 311,248, 10-9-90, Cl. D23-386.000.
Hamilton, Melvin: *See—*
Lee, Gary; and Hamilton, Melvin, 311,098, Cl. D6-380.000.
Hasert, Donald C. Lip balm cartridge holder. 311,260, 10-9-90, Cl. D28-85.000.
Hasler, Theodore J.: *See—*
Hiscott, William D.; Witlin, Ina; Hasler, Theodore J.; and Jastrzebski, Andrew T., 311,111, Cl. D7-409.000.
Hatfield, Tinker L., to Nike, Inc.; and Nike International Ltd. Shoe upper. 311,092, 10-9-90, Cl. D2-314.000.
Hayashi, Masaki, to Casio Computer Co., Ltd. Electronic typewriter. 311,204, 10-9-90, Cl. D18-1.000.
Hayashi, Mikio, to World Surveying Instrument Co., Ltd.; and Berger Instruments. Transit. 311,145, 10-9-90, Cl. D10-66.000.
Helikon Furniture Company: *See—*
Lee, Gary; and Hamilton, Melvin, 311,098, Cl. D6-380.000.
Hess, Milo, to M. Kamenstein, Inc. Tea kettle. 311,110, 10-9-90, Cl. D7-302.000.
Hickmott, Robert C., to John Henry Company, The. Plant tag. 311,215, 10-9-90, Cl. D20-26.000.
Highland Plastics: *See—*
Nelson, James L., 311,140, Cl. D9-454.000.
Hill, David W.; and Sweeney, Margaret C., to International Business Machines Corporation. Power unit cover for three portable hardfiles or the like. 311,176, 10-9-90, Cl. D14-100.000.
Hippely, Keith A.: *See—*
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Hirata, Koichi; and Kikuchi, Kozo, to Honda Giken Kogyo Kabushiki Kaisha. Automobile. 311,159, 10-9-90, Cl. D12-91.000.
Hiscott, William D.; Witlin, Ina; Hasler, Theodore J.; and Jastrzebski, Andrew T., to Ekco Housewares, Inc. Support stand for use in baking potatoes. 311,111, 10-9-90, Cl. D7-409.000.
Hoese, Fred O. Sunshade for boats. 311,169, 10-9-90, Cl. D12-318.000.
Hoffman, Ronald J. Saddle bag type carrier. 311,093, 10-9-90, Cl. D3-30.100.
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Jaber, Carl C. Toilet roll holder. 311,106, 10-9-90, Cl. D6-520.000.
Jankewitz, Axel, to A.W. Faber-Castell Unternehmungsverwaltung GmbH & Co. Nail polish applicator. 311,258, 10-9-90, Cl. D28-7.000.
Jannard, James H., to Oakley, Inc. Eyeglass earstem. 311,197, 10-9-90, Cl. D16-127.000.
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Jones, Jane. Diaper. 311,251, 10-9-90, Cl. D24-50.000.
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Kaneko, Koichi, to Seikosha Co., Ltd. Clock movement. 311,151, 10-9-90, Cl. D10-129.000.
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Kida, Kenichi, to Terumo Kabushiki Kaisha. Electronic clinical thermometer. 311,144, 10-9-90, Cl. D10-57.000.
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Kim, Byok N. Combined address book, calculator and key ring. 311,095, 10-9-90, Cl. D11-61.000.
Kingery, Donald S. Combination handset and base telephone. 311,186, 10-9-90, Cl. D14-143.000.
Kirby, Michael J., to Interstate Brands Corporation. Display stand for baked goods and the like. 311,103, 10-9-90, Cl. D6-468.000.
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Kovats, John J., to Space Adventures, Incorporated. Toy kite. 311,222, 10-9-90, Cl. D21-89.000.

Kovats, John J., to Space Adventures, Incorporated. Toy kite. 311,223, 10-9-90, Cl. D21-89.000.

Kroll, Frederick H. Toy puppet stage. 311,225, 10-9-90, Cl. D21-114.000.

L.A. Gear, Inc.: *See*—
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LaBarbera, Mannie. Combined drink stirrer and pick. 311,119, 10-9-90, Cl. D7-684.000.

LaBossiere, Donald G. J. Toy shed. 311,226, 10-9-90, Cl. D21-114.000.

Landy, Richard: *See*—
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Lazzeroni, John J.; and Lazzeroni, Melinda K. Microphone mount. 311,189, 10-9-90, Cl. D14-229.000.

Lazzeroni, Melinda K.: *See*—
Lazzeroni, John J.; and Lazzeroni, Melinda K., 311,189, Cl. D14-229.000.

Learney, Alan P. Combination pocket tool. 311,124, 10-9-90, Cl. D8-105.000.

Lee, Cheng-Chang; and Lin, Morris J., to Acer Incorporated. Computer. 311,174, 10-9-90, Cl. D14-100.000.

Lee, Gary; and Hamilton, Melvin, to Helikon Furniture Company. Chair. 311,098, 10-9-90, Cl. D6-380.000.

Lin, Big J. Diskette drive. 311,175, 10-9-90, Cl. D14-109.000.

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Lipp, Donald. Combined watch and photo display. 311,143, 10-9-90, Cl. D10-31.000.

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Lundquist, Alan. Oil filter adaptor for use with an internal combustion engine. 311,239, 10-9-90, Cl. D23-209.000.

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M. Kamenstein, Inc.: *See*—
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MacConkey, James S.: *See*—
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Maes, Paul, to Procter & Gamble Company, The. Bottle. 311,134, 10-9-90, Cl. D9-378.000.

Maes, Paul, to Procter & Gamble Company, The. Bottle. 311,135, 10-9-90, Cl. D9-378.000.

Magaraggia, Antonietta, nee Ferrighi, to A.C.E.A. Manodomestici S.r.L. Combined salt and pepper container. 311,113, 10-9-90, Cl. D7-596.000.

Makidera, Tooru, to Sharp Corporation. Keyboard. 311,172, 10-9-90, Cl. D14-100.000.

Malinovsky, Constantin, to Architectural Creative Lighting, Inc. Illuminated sign. 311,214, 10-9-90, Cl. D20-42.000.

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Mayo, Noel; Liss, Zalman A.; and Spira, Joel S., to Lutron Electronics Co., Inc. Wall mounted power control panel. 311,170, 10-9-90, Cl. D13-164.000.

McCoy, Lewis M. Leaf ornamented telephone cord or similar article. 311,190, 10-9-90, Cl. D14-240.000.

McKinstry, Kimberly A., to L.A. Gear, Inc. Element of a shoe upper. 311,091, 10-9-90, Cl. D2-314.000.

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Mitsuhashi, Toshio, to Citizen Watch Co., Ltd. Printer. 311,207, 10-9-90, Cl. D18-13.000.

Miyazawa, Atsushi, to Seiko Epson Corporation. Optical magnetic disk cartridge. 311,181, 10-9-90, Cl. D14-114.000.

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Moore, A. Edward. Truck top cover. 311,165, 10-9-90, Cl. D12-156.000.

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Mori, Tatsuo, to Sharp Corporation. Combined tape recorder and radio. 311,187, 10-9-90, Cl. D14-163.000.

Murata, Ryo, to Casio Computer Co., Ltd. Clock. 311,141, 10-9-90, Cl. D10-15.000.

Nakayama, Masamichi; and Hoshino, Yoshiki, to Hoshino Gakki Co., Ltd. Drum holder mount. 311,200, 10-9-90, Cl. D17-22.000.

Nakayama, Masamichi; and Hoshino, Yoshiki, to Hoshino Gakki Co., Ltd. Drum holder clamp. 311,201, 10-9-90, Cl. D17-22.000.

Nakayama, Masamichi; and Hoshino, Yoshiki, to Hoshino Gakki Co., Ltd. Clamp for drum. 311,202, 10-9-90, Cl. D17-22.000.

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Oot, MaryAnn. Combined marking pen and cap therefor. 311,211, 10-9-90, Cl. D19-43.000.

Orton, Vicki A. Tailgater portable kitchen. 311,114, 10-9-90, Cl. D7-605.000.

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Pentland, Robert A. Tuna can squeezer. 311,116, 10-9-90, Cl. D7-666.000.

Peters, Leo J., III, to PMST Ltd. Computer enclosure. 311,177, 10-9-90, Cl. D14-102.000.

Petersen, Bryan E.; and Kanceljak, Michael, to American Cyanamid Company. Cover for tamper resistant bait tray or similar article. 311,235, 10-9-90, Cl. D22-119.000.

Petersen, Bryan E.; and Kanceljak, Michael, to American Cyanamid Company. Tamper resistant bait tray or similar article. 311,236, 10-9-90, Cl. D22-119.000.

Petersen, Bryan E.; and Kanceljak, Michael, to American Cyanamid Company. Cover for tamper resistant bait tray or similar article. 311,237, 10-9-90, Cl. D22-119.000.

Petersen, Bryan E.; and Kanceljak, Michael, to American Cyanamid Company. Tamper resistant bait tray or similar article. 311,238, 10-9-90, Cl. D22-119.000.

Pettway, Minnie L. Condom. 311,252, 10-9-90, Cl. D24-99.000.

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Pickard, Barbara G. Baby bath apron. 311,087, 10-9-90, Cl. D2-226.000.

Pilatowicz, Edward J.; Carsello, Anthony; and Landy, Richard, to Allegretti & Company. Hedge trimmer. 311,121, 10-9-90, Cl. D8-8.000.

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Reid, Mary J., to Kohler Co. Toilet. 311,242, 10-9-90, Cl. D23-301.000.

Reuters Limited: *See*—
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Robert, Jean, to Swatch AG (Swatch SA). Watch dial. 311,150, 10-9-90, Cl. D10-126.000.
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Smith, Loretta. Doll. 311,228, 10-9-90, Cl. D21-166.000.
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Stramel, Kenneth L. Aquarium. 311,264, 10-9-90, Cl. D30-101.000.
Strignano, Joseph, to I. W. Industries. Bathroom faucet. 311,241, 10-9-90, Cl. D23-241.000.
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Sugimoto, Isao, to Citizen Watch Co., Ltd. Printer. 311,206, 10-9-90, Cl. D18-13.000.
Sunshine, William N. Bicycle seat. 311,097, 10-9-90, Cl. D6-354.000.
Svee, Roy M., to J. B. Goodhouse, Inc. Bookmark. 311,209, 10-9-90, Cl. D19-34.000.
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Tsuji, Shintaro, to Sanrio Company, Ltd. Paper clip. 311,212, 10-9-90, Cl. D19-65.000.
Vargo, John. Protective hat. 311,088, 10-9-90, Cl. D2-232.000.
Vaupel, Michael C.; and Mendoza, Kenneth P., to Masco Building Products Corp. Water closet. 311,243, 10-9-90, Cl. D23-301.000.
Weiss, Michael R.: *See*—
Allard, Peter B.; Weiss, Michael R.; and Bleck, Gregory D., 311,244, Cl. D23-325.000.
Whitaker, Richard J., to Commercial Brains Limited. Wall support bracket. 311,130, 10-9-90, Cl. D8-381.000.
Wico Distribution Corp.: *See*—
Althans, Richard K., 311,218, Cl. D21-48.000.
Wiedmann, Helmut, to Eyemetrics-Systems AG. Nose pad for eyeglasses. 311,196, 10-9-90, Cl. D16-126.000.
Wiseman, Kay E.; and Kichenside, Brian E., to Conopco, Inc. Container. 311,133, 10-9-90, Cl. D9-370.000.
Witlin, Ina: *See*—
Hiscott, William D.; Witlin, Ina; Hasler, Theodore J.; and Jastrzebski, Andrew T., 311,111, Cl. D7-409.000.
Wolff, Joan P., to Coats & Clark, Inc. Pie topper plate. 311,117, 10-9-90, Cl. D7-675.000.
Wolff, Joan P., to Coats & Clark, Inc. Pie topper plate. 311,118, 10-9-90, Cl. D7-675.000.
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Hayashi, Mikio, 311,145, Cl. D10-66.000.
Wright, John R. Child carrier. 311,162, 10-9-90, Cl. D12-129.000.
Yamasaki, Yoshikiyo, to Kabushiki Kaisha Japan Health; and Kabushiki Kaisha Fuji Iryoki. Bubble generator for a bathtub. 311,250, 10-9-90, Cl. D24-38.000.
Yanagisawa, Mitsuo, to Pearl Musical Instrument Co. Snare drum lug casing. 311,203, 10-9-90, Cl. D17-22.000.
Yasuno, Hiroshi: *See*—
Fujii, Yuzo; and Yasuno, Hiroshi, 311,183, Cl. D14-126.000.
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Yeh, Quey-Mei: *See*—
Yeh, Hsu-Chieh; and Yeh, Quey-Mei, 311,096, Cl. D6-305.000.
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Zimmerman, Joseph. Handle positioning escutcheon. 311,125, 10-9-90, Cl. D8-352.000.
911 Inc.: *See*—
Barnhill, George T., III, 311,129, Cl. D8-373.000.

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Meilland, deceased; Marie-Louise, 7,347, Cl. 8.000.

Craig, Richard; and Glicenstein, Leon, to Research Corporation Technologies, Inc. Geranium plant "Misty". 7,350, 10-9-90, Cl. 68.000.

Craig, Richard; and Glicenstein, Leon, to Research Corporation Technologies, Inc. Geranium plant #821-(82-116-13). 7,351, 10-9-90, Cl. 68.000.

Etablissement Guillou Feres Jacques, Bernard et Maruice: *See*—
Guillou, Jacques; Guillou, Bernard; and Guillou, Maurice, 7,353, Cl. 68.000.

Etablissement Guillou Freres Jacques, Bernard et Maurice: *See*—
Guillou, Jacques; Guillou, Bernard; and Guillou, Maurice, 7,352, Cl. 68.000.

Glicenstein, Leon: *See*—
Craig, Richard; and Glicenstein, Leon, 7,350, Cl. 68.000.
Craig, Richard; and Glicenstein, Leon, 7,351, Cl. 68.000.

Guillou, Bernard: *See*—
Guillou, Jacques; Guillou, Bernard; and Guillou, Maurice, 7,352, Cl. 68.000.
Guillou, Jacques; Guillou, Bernard; and Guillou, Maurice, 7,353, Cl. 68.000.

Guillou, Jacques; Guillou, Bernard; and Guillou, Maurice, to Etablissement Guillou Freres Jacques, Bernard et Maurice. Variety of Geranium named Mimi. 7,352, 10-9-90, Cl. 68.000.

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Guillou, Maurice: *See*—
Guillou, Jacques; Guillou, Bernard; and Guillou, Maurice, 7,352, Cl. 68.000.
Guillou, Jacques; Guillou, Bernard; and Guillou, Maurice, 7,353, Cl. 68.000.

Hengst, William E. Bill Hengst October Gem Plum. 7,348, 10-9-90, Cl. 38.000.

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CLASSIFICATION OF PATENTS

ISSUED OCTOBER 9, 1990

NOTE.—First number, class; second number, subclass; third number, patent number

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228 4,961,233
234 4,961,234
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CLASS 5

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514 4,962,368
572 4,962,369
619 4,962,395
623 4,962,370
626 4,962,371
640 4,962,372
693 4,962,373
781 4,962,374
782 4,962,375
784 4,962,376
825.440 4,962,377
825.500 4,962,378
825.510 4,962,379

CLASS 341

120 4,962,380

CLASS 342

372 4,962,381
4,962,382

CLASS 343

700 MS 4,962,383
786 4,962,384

CLASS 346

1.1 4,962,385
4,962,386
76 PH 4,962,387
136 4,962,388
140 R 4,962,389
4,962,390
4,962,391
145 4,962,392
150 4,962,393
160.1 4,962,394

CLASS 350

3.68 4,961,615
96.10 4,961,617
96.12 4,961,618
4,961,619
96.15 4,961,620
96.16 4,961,621
96.18 4,961,622
96.2 4,961,616
96.20 4,961,623
4,961,624
174 4,961,625
4,961,626
319 4,961,627
4,961,628
332 4,961,629
333 4,961,630
354 4,961,631
358 4,961,632
392 4,961,633
403 4,961,634
429 4,961,635
520 4,961,636
573 4,961,637
632 4,961,638

CLASS 351

41 4,961,639
44 4,961,640

CLASS 352

174 4,962,396

CLASS 353

27 R 4,961,641
38 4,961,642

CLASS 354

21 4,962,397
86 4,962,398
195.1 4,962,399
4,962,400
275 4,962,401

CLASS 355

27 4,962,402
38 4,962,403
51 4,962,404
84 4,962,405
208 4,962,407
245 4,962,408

CLASS 356

28 4,961,643
73.1 4,961,644
312 4,961,645
328 4,961,646

CLASS 357

22 4,962,409
4,962,410
23.4 4,962,411
30 4,962,412
42 4,962,413
71 4,962,414
74 4,962,415
81 4,962,416

CLASS 358

27 4,962,417
29 4,962,418
37 4,962,419
60 4,962,420
76 4,962,421
88 4,962,422
101 4,962,423
103 4,962,424
139 4,962,425
167 4,962,426
188 4,962,427
4,962,428
213.13 4,962,429
296 4,962,430
4,962,431
302 4,962,432
335 4,962,433
340 4,962,434

CLASS 360

72.2 4,962,435
96.3 4,962,436
103 4,962,437
130.21 4,962,438

CLASS 361

56 4,962,320
95 4,962,439
126 4,962,440
234 4,962,441
356 4,962,443
382 4,962,444
386 4,962,445
400 4,962,446
403 4,962,442
422 4,962,447

CLASS 362

268 4,962,450

CLASS 364

146 4,962,448
200 4,962,449
419 4,962,452
424.02 4,962,453
426.02 4,962,455
431.01 4,962,456
443 4,962,457
4,962,458
464.02 4,962,454
4,962,459
474.03 4,962,460
482 4,962,461
492 4,962,462
518 4,962,463
4,962,464
4,962,465
4,962,466
519 4,962,467
521 4,962,468
561 4,962,469
572 4,962,470
787 4,962,471
900 4,962,451
4,962,472
4,962,473
4,962,474
4,962,475

CLASS 365

53 4,962,476
87 4,962,477
96 4,962,478
119 4,962,479
151 4,962,480
185 4,962,481
189.11 4,962,482
221 4,962,483
226 4,962,484
229 4,962,485
230.03 4,962,486
233.5 4,962,487

CLASS 366

139 4,961,647

CLASS 367

3 4,962,488
32 4,962,489
35 4,962,490

CLASS 368

21 4,962,491

CLASS 369

13 4,962,492
44.11 4,962,493
48 4,962,494

CLASS 370

1 4,962,495
11 4,962,496
60.1 4,962,497
94.1 4,962,498
4,962,499

CLASS 371

24 4,962,500
51.1 4,962,501

CLASS 372

8 4,962,502
32 4,962,503
41 4,962,504
72 4,962,505
94 4,962,506

CLASS 375

1 4,962,507
4,962,508
7 Re.33,380
17 4,962,509
67 4,962,510

CLASS 376

234 4,961,897
245 4,961,898
260 Re.33,373
4,961,899
272 4,961,900

CLASS 377

69 4,962,511
78 4,962,512

CLASS 378

12 4,962,513
18 4,962,514
37 4,962,515
45 4,962,516
48 4,962,517
50 4,962,518
133 4,962,519

CLASS 379

5 4,962,522
29 4,962,520
53 4,962,521
58 4,962,523
61 4,962,524
92 4,962,525
100 4,962,526
418 4,962,527
442 4,962,528

CLASS 380

15 4,962,529
23 4,962,530
24 4,962,531
25 4,962,532
4,962,533
34 4,962,534

CLASS 381

15 Re.33,381
43 4,962,535
49 4,962,536
68.6 4,962,537

CLASS 382

1 4,962,538
9 4,962,539
17 4,962,540
30 4,962,541
54 4,962,542

CLASS 384

19 4,961,648
49 4,961,649
4,961,650
51 4,961,651
312 4,961,652
447 4,961,653
517 4,961,654

CLASS 388

802 Re.33,379

CLASS 400

171 4,961,655
196.1 4,961,656
599 4,961,657
636.1 4,961,658
693 4,961,659
697.1 4,961,660

CLASS 401

6 4,961,661
42 4,961,662
78 4,961,663
127 4,961,664
129 4,961,665

CLASS 402

79 4,961,666

CLASS 403

11 4,961,667
351 4,961,668
359 4,961,669

CLASS 405

53 4,961,670
168 4,961,671
287 4,961,673

CLASS 408

1 R 4,961,675
14 4,961,674
144 4,961,672

CLASS 410

53 4,961,676
129 4,961,677

CLASS 414

111 4,961,679
458 4,961,680
607 4,961,681
620 4,961,682
783 4,961,683
786 4,961,684

CLASS 415

170.1 4,961,678
197 4,961,685

CLASS 416

223 A 4,961,686
230 4,961,687

CLASS 417

92 4,961,688
118 4,961,689
222 4,961,690
237 4,961,691
241 4,961,692
363 4,961,693
464 4,961,694

CLASS 419

2 4,961,901
12 4,961,902
19 4,962,084

CLASS 420

79 4,961,903
123 4,961,904
460 4,961,905

CLASS 422

88 4,961,916
102 4,961,906
116 4,961,915
144 4,961,907
173 4,961,908

CLASS 423

53 4,961,910
72 4,961,911
87 4,961,909
239 4,961,917
322 4,961,912
351 4,961,913
376 4,961,914
479 4,961,918
598 4,961,919

CLASS 424

9 4,961,920
47 4,961,921
49 4,961,923
52 4,961,924
70 4,961,922
71 4,961,925
85.1 4,961,926
94.3 4,961,927
196.1 4,961,929
411 4,961,930
430 4,961,931
455 4,961,932
533 4,961,928
630 4,961,933

CLASS 425

72.2 4,961,695
149 4,961,696
327 4,961,697
387.1 4,961,699
394 4,961,700
527 4,961,701
595 4,961,702

CLASS 426

3 4,961,935
7 4,961,936
19 4,961,937
36 4,961,938
61 4,961,939
89 4,961,940
94 4,961,941
4,961,942
002 4,961,934
102 4,961,943
107 4,961,944
269 4,961,945
299 4,961,946
482 4,961,947
518 4,961,949
523 Re.33,374
556 4,961,948
581 4,961,950
602 4,961,951
615 4,961,952
656 4,961,953

CLASS 427

2 4,961,954
38 4,961,958
48 4,961,959
54.1 4,961,960
57 4,961,955
70 4,961,956
125 4,961,957
140 4,961,961
180 4,961,962
208.8 4,961,963
211 4,961,964
286 4,961,965
299 4,961,966
302 4,961,967
356 4,961,968
376.2 4,961,971
388.1 4,961,972
423 4,961,973

CLASS 428

34 4,961,975
34.2 Re.33,376
4,961,974
34.6 4,961,976
36.3 4,961,977
40 4,961,978
41 4,961,982
64 4,961,979
67 4,961,980
72 4,961,981
121 4,961,983
192 4,961,984
196 4,961,985
201 4,961,986
209 4,961,987
229 4,961,988
4,961,989
240 4,961,990
246 4,961,991
332 4,961,992
343 4,961,993
408 4,961,994
409 4,961,995
421 4,961,996
423.1 4,961,997
426 4,961,998
427 4,961,999
461 4,962,000
524 4,962,001
609 4,962,002
614 4,962,003
626 4,962,004
670 4,962,005
4,962,007
703 4,962,006

CLASS 430

66 4,962,008
138 4,962,009
4,962,010
281 4,962,011
311 4,962,012
338 4,962,013
393 4,962,014
544 4,962,018
551 4,962,017
572 4,962,015
603 4,962,016

CLASS 431

5 4,961,703

CLASS 432

8 4,961,704
58 4,961,705

CLASS 433

86 4,961,698
214 4,961,706
215 4,961,707

CLASS 434

406 4,961,708

CLASS 435

4 4,962,019
6 4,962,020
4,962,037
7 4,962,021
4,962,022
4,962,023
14 4,962,024
25 4,962,025
34 4,962,036
69.51 4,961,969
98 4,962,026
147 4,962,027
172.3 4,962,028
192 4,962,029
209 4,962,030
240.243 4,962,033
240.27 4,962,032
252.8 4,962,055
262 4,962,034
280 4,962,031
320 4,962,035

CLASS 436

10 4,962,038
40 4,962,039
84 4,961,970
135 4,962,040
150 4,962,041
161 4,962,042
165 4,962,043
177 4,962,044
501 4,962,045
518 4,962,047
533 4,962,046
548 4,962,048

CLASS 437

13 4,962,049
22 4,962,050
26 4,962,051
31 4,962,052
4,962,053
40 4,962,054
62 4,962,056
81 4,962,057
187 4,962,058
189 4,962,059
192 4,962,060
195 4,962,061
225 4,962,062
228 4,962,063
4,962,064
242 4,962,065

CLASS 439

66 4,961,709
267 4,961,710
357 4,961,711
436 4,961,712
587 4,961,713

CLASS 441

10 4,961,714
74 4,961,715

CLASS 446

75 4,961,716
76 4,961,717
406 4,961,718

CLASS 455

89 4,962,543
186 4,962,544
200 4,962,545

CLASS 474

50 4,961,719
80 4,961,720

CLASS 475

47 4,961,721

CLASS 494

36 4,961,722
56 4,961,723
68 4,961,724

CLASS 501

19 4,962,066
45 4,962,067
49 4,962,068
90 4,962,069
95 4,962,070
134 4,962,071
150 4,962,279

CLASS 502

4 4,962,073
67 4,962,074
71 4,962,075
158 4,962,076
220 4,962,077
325 4,962,078
439 4,962,280

CLASS 503

200 4,962,072
226 4,962,079
227 4,962,080
4,962,081

CLASS 505

1 4,962,083
4,962,085
4,962,086
4,962,087
4,962,088
001 4,962,082

CLASS 512

6 4,962,089
9 4,962,090

CLASS 514

2 Re.33,375
4,962,091
14 4,962,277
23 4,962,092
30 4,962,146
53 4,962,093
54 4,962,094
91 4,962,095
92 4,962,096
114 4,962,097
170 4,962,098
177 4,962,099
202 4,962,100
210 4,962,101
4,962,103
212 4,962,102
4,962,104
4,962,105
234.2 4,962,106
237.5 4,962,107
249 4,962,108
252 4,962,110
255 4,962,111
256 4,962,109
300 4,962,112
307 4,962,113
311 4,962,114
326 4,962,115
353 4,962,116
365 4,962,117
383 4,962,118
384 4,962,119
399 4,962,120
4,962,278
419 4,962,121
460 B1 3,794,732
466 4,962,122
514 4,962,123
568 4,962,124
569 4,962,125
578 4,962,127
587 4,962,126
647 4,962,128
724 4,962,129
846 4,962,130

CLASS 521

51 4,962,131
55 4,962,132
56 4,962,133

CLASS 523

109 4,962,134
122 4,962,135
220 4,962,136
400 4,962,137
428 4,962,138
468 4,962,139

CLASS 524

35 4,962,140
92 4,962,141
100 4,962,142
4,962,143
118 4,962,144
310 4,962,145
460 4,962,147
504 4,962,148
555 4,962,149
602 4,962,150
788 4,962,151
4,962,152
837 4,962,153

CLASS 525

54.1 4,962,154
4,962,155
100 4,962,156
132 4,962,157
279 4,962,158
345 Re.33,377
386 4,962,159
404 4,962,160
422 4,962,161
4,962,162
445 4,962,164
463 4,962,163
479 4,962,165
506 4,962,166

CLASS 526

125 4,962,167
193 4,962,168
209 4,962,169
212 4,962,170
240 4,962,173
266 4,962,171
318.42 4,962,172

CLASS 528

15 4,962,174
19 4,962,175
4,962,176
26 4,962,177
33 4,962,178
90 4,962,179
176 4,962,180
183 4,962,181
230 4,962,182
342 4,962,183
392 4,962,184
413 4,962,281
497 4,962,185

CLASS 530

218 4,962,186
350 4,962,187
389 4,962,188
391 4,962,189

CLASS 534

573 4,962,190
698 4,962,191

CLASS 536

18.1 4,962,192
24 4,962,193
26 4,962,194

CLASS 540

230 4,962,195
357 4,962,196

CLASS 544

31 4,962,197
182 4,962,198
239 4,962,199
333 4,962,200

CLASS 546

112 4,962,202
180 4,962,203

CLASS 548

408 4,962,204
549 4,962,205

CLASS 549

246 4,962,206
266 4,962,208
334 4,962,207
419 4,962,209
429 4,962,210
436 4,962,211
491 4,962,212

CLASS 552

12 4,962,213

CLASS 556

33 4,962,214
45 4,962,215
129 4,962,216
429 4,962,217
445 4,962,218
456 4,962,221
468 4,962,219
473 4,962,220

CLASS 558

408 4,962,223

CLASS 560

28 4,962,224
41 4,962,222
163 4,962,225
205 4,962,226

CLASS 562

8 4,962,227
4,962,228
21 4,962,229
433 4,962,230
575 4,962,231
825 4,962,282
851 4,962,232
866 4,962,233

CLASS 564

63 4,962,283
194 4,962,284
384 4,962,234

CLASS 568

493 4,962,235
615 4,962,236
618 4,962,237
621 4,962,238
697 4,962,239
730 4,962,240
737 4,962,241
822 4,962,242
909.5 4,962,243

CLASS 570

127 4,962,246
165 4,962,244
211 4,962,245
240 4,962,247

CLASS 585

12 4,962,248
329 4,962,249
417 4,962,250
419 4,962,251
438 4,962,252
4,962,253
452 4,962,254
467 4,962,255
4,962,256
475 4,962,257
480 4,962,258
4,962,259
481 4,962,260
500 4,962,261
512 4,962,262
646 4,962,263
648 4,962,264
660 4,962,265
4,962,266
670 4,962,267
705 4,962,268
739 4,962,269
819 4,962,270
4,962,271
826 4,962,272
831 4,962,273
833 4,962,274
834 4,962,275
867 4,962,276

CLASS 600

31 4,961,725

CLASS 604

74 4,961,726
75 4,961,727
110 4,961,728
164 4,961,729
198 4,961,730
264 4,961,731
293 4,961,732
4,961,733
349 4,961,734
378 4,961,735
385.1 4,961,736
385.2 4,961,737

CLASS 606

15 4,961,738
37 4,961,739
61 4,961,740
139 4,961,741
147 4,961,742
158 4,961,743
166 4,961,744
180 4,961,421

CLASS 623

6 4,961,745
4,961,746
12 4,961,747
22 4,961,748

CLASSIFICATION OF DESIGNS

D2—	190	311,085		666	311,116		75	311,146		102	311,177			311,206
	226	311,086		675	311,117		97	311,147		105	311,178			311,207
		311,087			311,118		114	311,148		109	311,175	D19—	26	311,219
	232	311,088		684	311,119		126	311,149		110	311,179			311,220
	248	311,089		688	311,120			311,150		113	311,180		27	311,208
	274	311,090	D8—	8	311,121		129	311,151		114	311,181		34	311,209
	314	311,091		49	311,122	D11—	19	311,152			311,182		35	311,210
		311,092		69	311,123		32	311,153		126	311,183		43	311,211
D3—	30.1	311,093		105	311,124		48	311,154		141	311,184		65	311,212
	32	311,094		352	311,125		61	311,095		142	311,185		77	311,213
D6—	305	311,096		354	311,126		173	311,155		143	311,186	D20—	26	311,215
	354	311,097		356	311,127		184	311,156		163	311,187		42	311,214
	380	311,098		373	311,128		202	311,157		191	311,188	D21—	8	311,216
	397	311,099			311,129		221	311,158		229	311,189		23	311,217
	437	311,100		381	311,130	D12—	91	311,159		240	311,190		48	311,218
	446	311,101		397	311,131		98	311,160		241	311,191		54	311,221
	461	311,102	D9—	367	311,132		129	311,162	D15—	127	311,192		89	311,222
	468	311,103		370	311,133		147	311,163		139	311,193			311,223
	495	311,104		378	311,134		155	311,164		140	311,194		108	311,224
	501	311,105			311,135		156	311,165	D16—	102	311,195		114	311,225
	520	311,106			311,136		174	311,166		126	311,196			311,226
	553	311,107		418	311,137		193	311,167		127	311,197		153	311,227
	596	311,108		425	311,138		215	311,161		243	311,198		166	311,228
	601	311,109		443	311,139		318	311,169			311,199		168	311,229
D7—	302	311,110		454	311,140	D13—	164	311,170	D17—	22	311,200		169	311,230
	409	311,111	D10—	15	311,141	D14—	100	311,171			311,201		171	311,231
	542	311,112		24	311,142			311,172			311,202		191	311,232
	596	311,113		31	311,143			311,173			311,203		194	311,233
	605	311,114		57	311,144			311,174	D18—	1	311,204		199	311,234
	616	311,115		66	311,145			311,176		13	311,205		317	311,168

D22—	119	311,235			311,236			311,237			311,238	D23—	209	311,239
		225	311,240			241	311,241			301	311,242			311,243
		325	311,244			359	311,245			368	311,246			377	311,247
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